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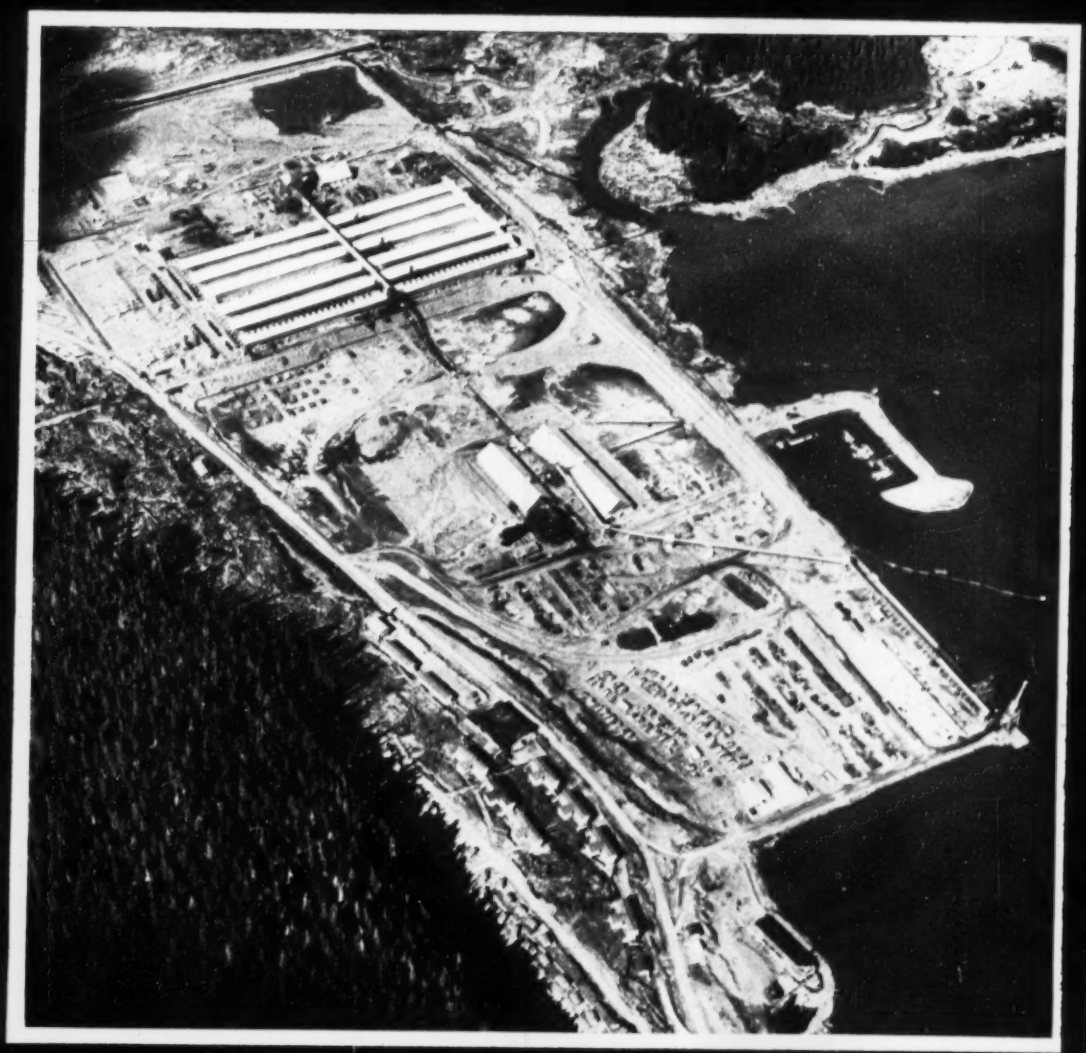

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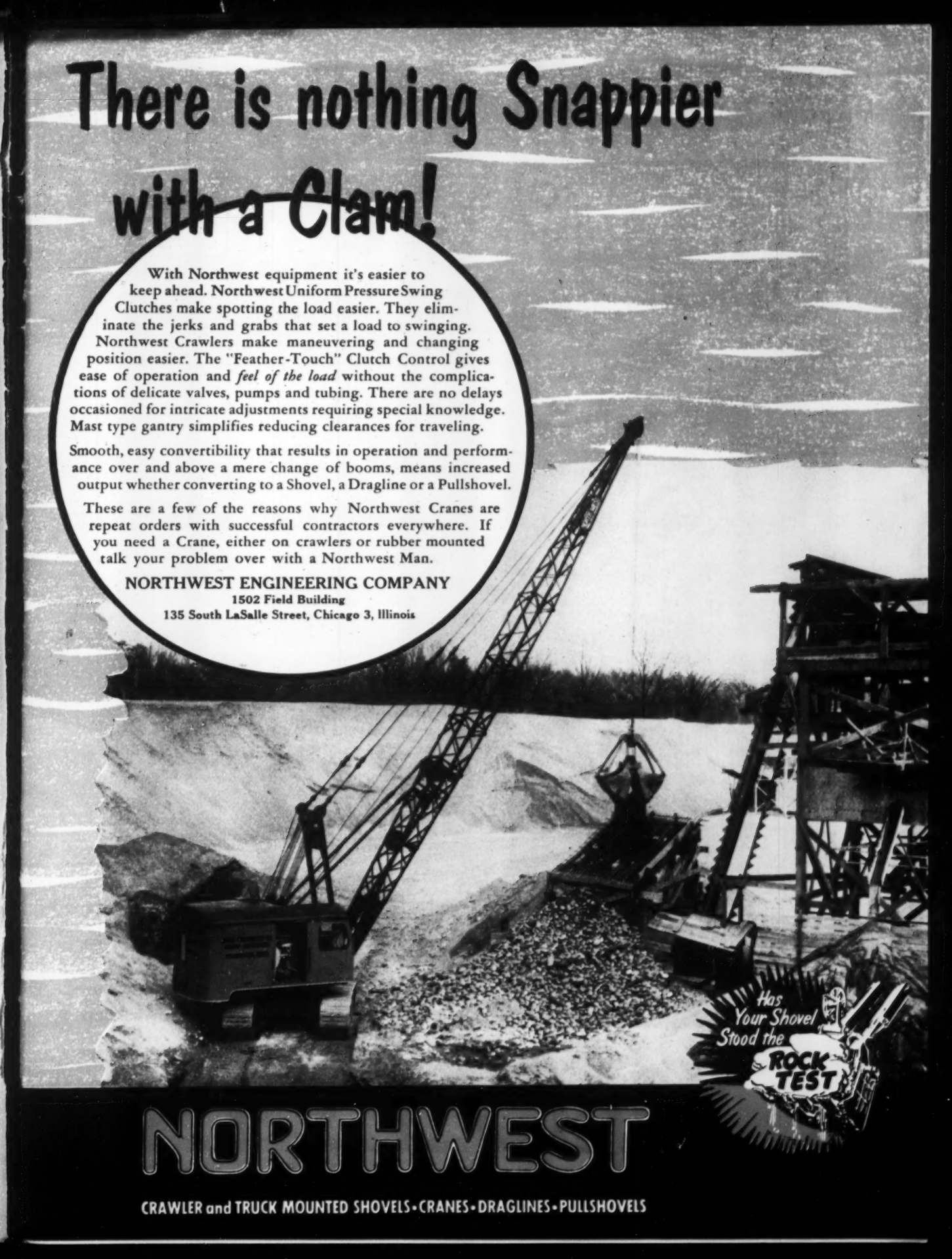

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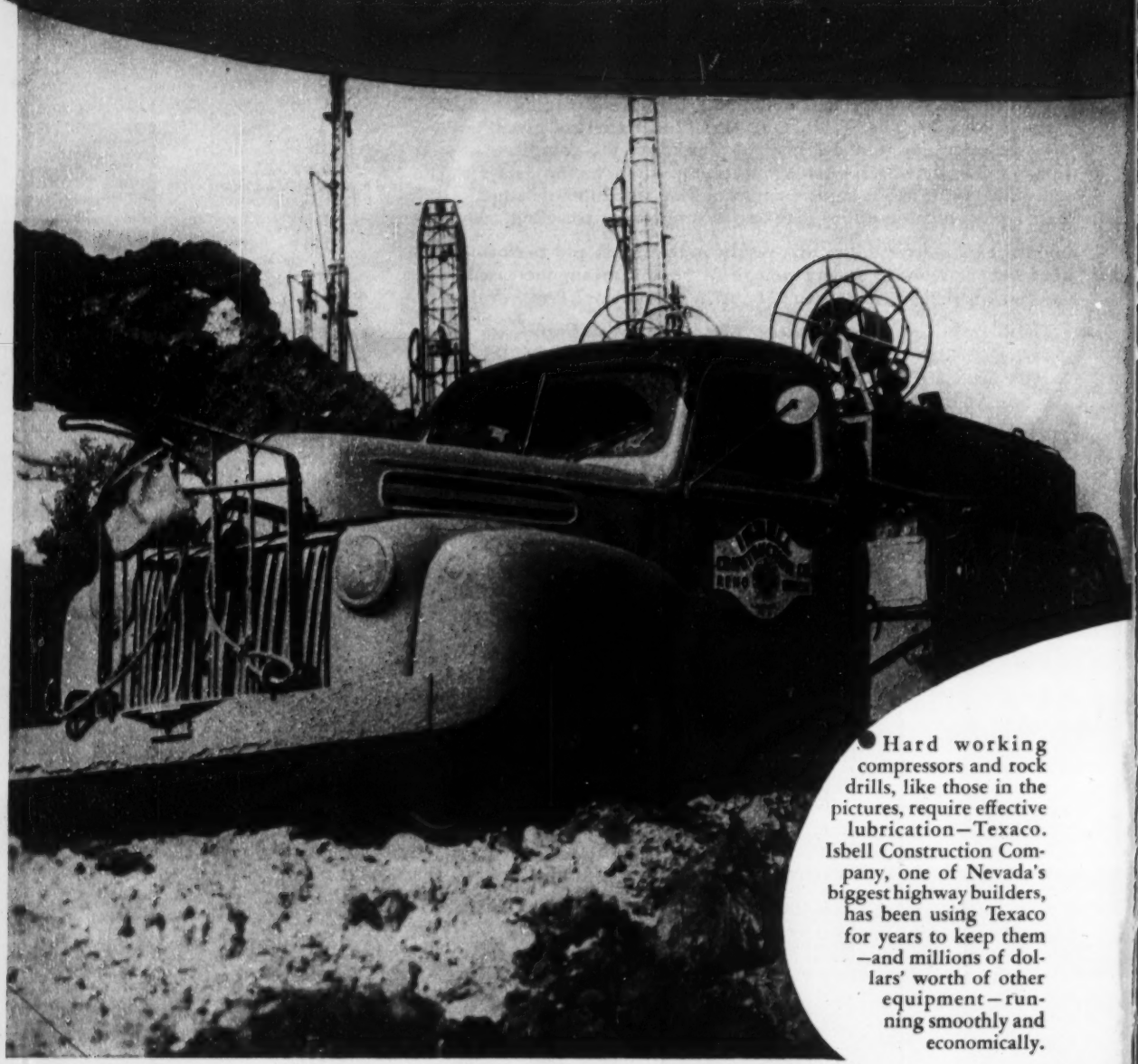
TEXACO HELPS ISBELL COMPRESSOR UPKEEP



Hard working compressors and rock drills, like those in the pictures, require effective lubrication—Texaco. Isbell Construction Company, one of Nevada's biggest highway builders, has been using Texaco for years to keep them—and millions of dollars' worth of other equipment—running smoothly and economically.

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TEXACO SIMPLIFIED LUBRICATION PLAN—With *not more than six* Texaco Lubricants you can handle *all* your major lubrication. The plan saves time and money, reduces lubricant inventories, eliminates lubrication mistakes. Ask a Texaco Lubrication Engineer all about it.

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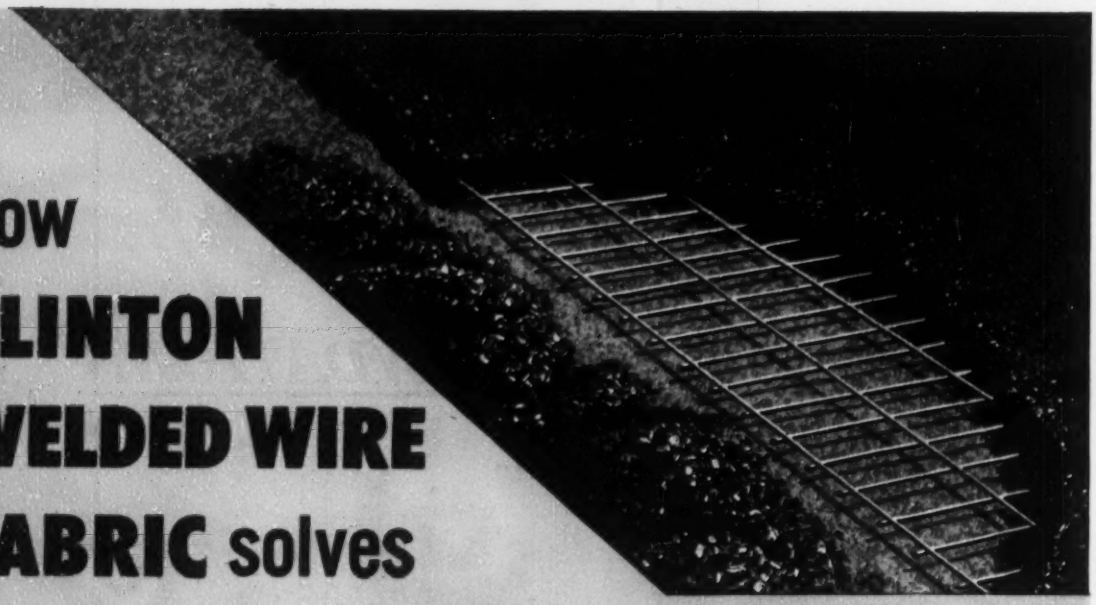

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you can see it on film...

CF&I makes available, without cost, a film demonstrating this application of welded wire reinforcement. This film, "Something New in Resurfacing Design", illustrates in color how welded wire fabric has actually been used on a major asphaltic concrete resurfacing project. A letter to our nearest District Sales Office is all that is needed for a personal viewing of this film. Our representative will be glad to arrange for showings to interested groups, too.

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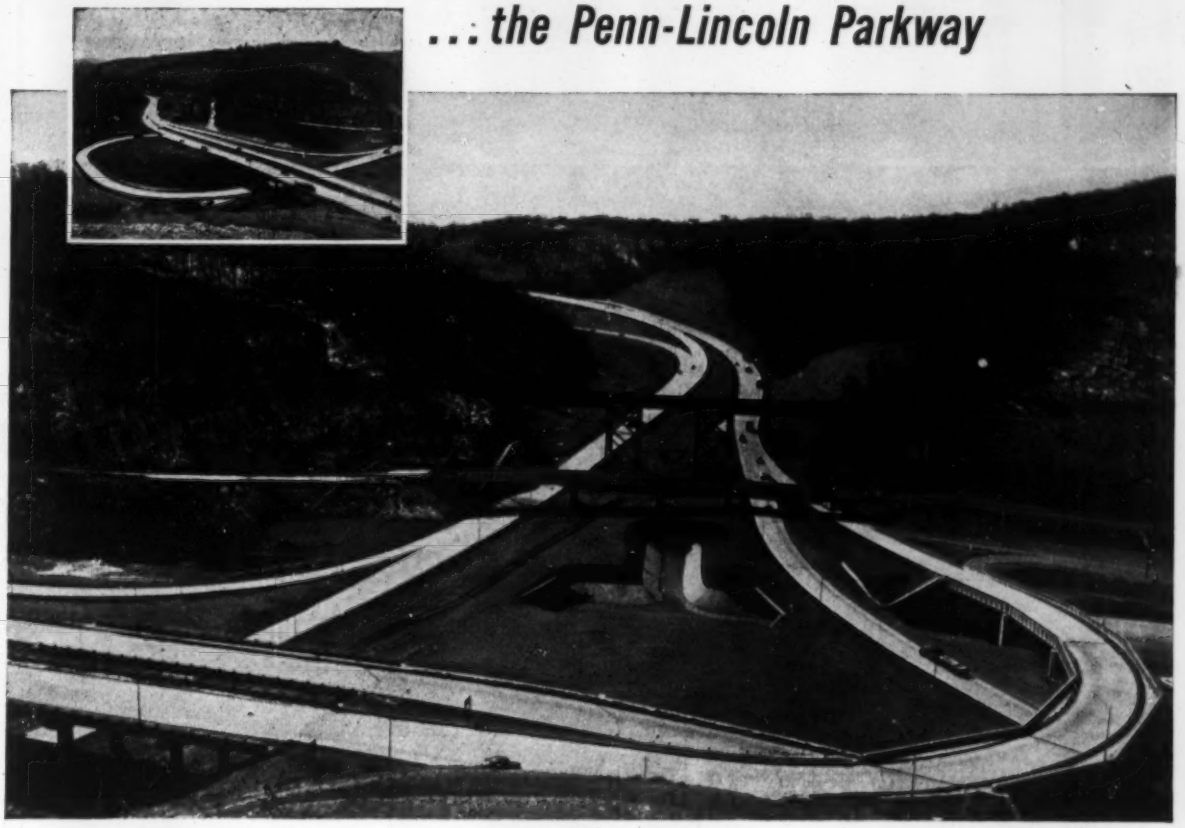
...the Penn-Lincoln Parkway



Penn-Lincoln Parkway

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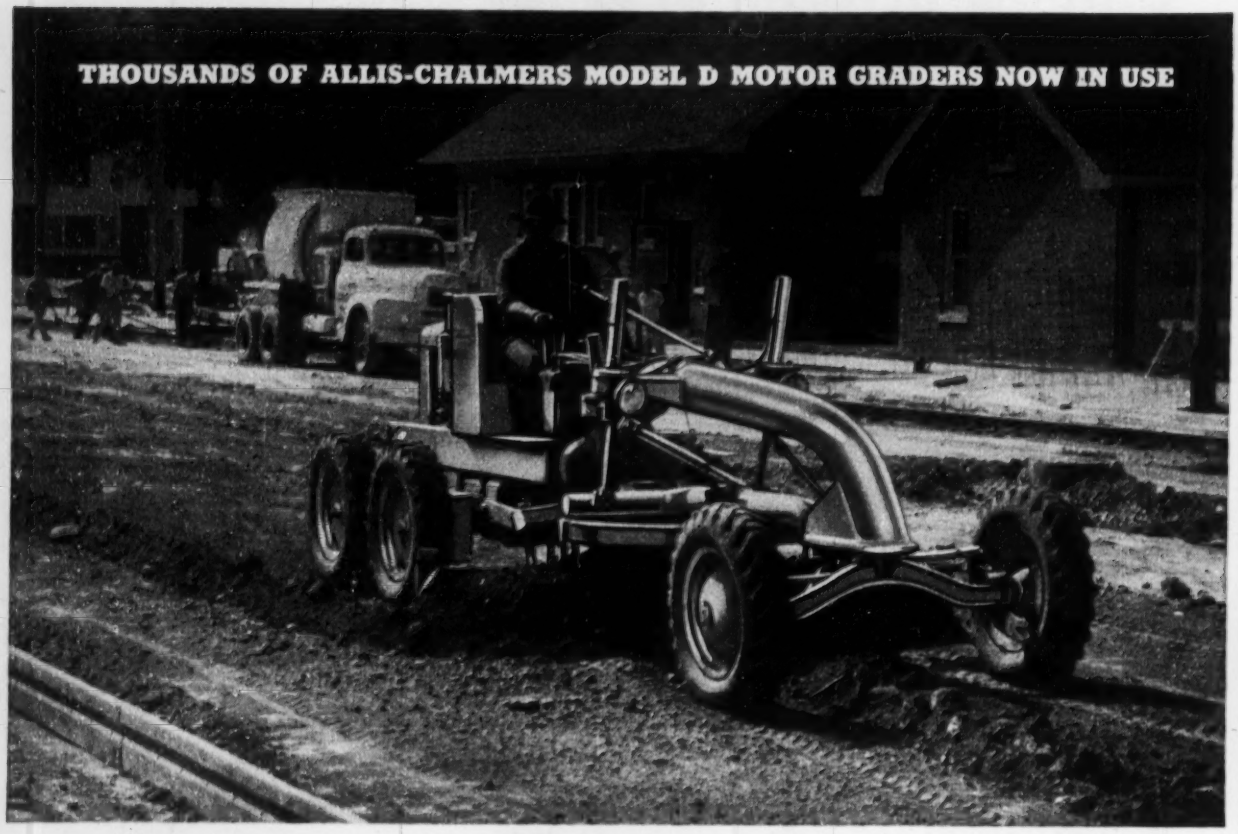
Finishing between forms on road and street construction is a natural for the compact Model D and its precision hydraulic control, excellent operator visibility.



Five Years in the Field Prove Big-Grader Performance . . . at One-Third the Cost

From its introduction in 1949, the Allis-Chalmers Model D established itself as a real pacemaker in the motor grader field. It was the first low-cost machine to offer such big-grader design and performance advantages as tandem drive, single member tubular frame and the famous ROLL-AWAY moldboard. To its thousands of satisfied owners, the Model D has proved again and again that it does outstanding work on both construction and maintenance.

The usefulness of this amazing machine goes far beyond basic blade functions, with several easily mounted attachments that make it invaluable all year 'round: hydraulically controlled, rear-end loader; shoulder maintainer that is interchangeable with loader bucket; "midship-mounted" hydraulically controlled scarifier; both blade and V-type snowplows.

ROLL-AWAY and POWER-CRATER are Allis-Chalmers trademarks.

To help cost and profit-conscious contractors improve their competitive positions, Allis-Chalmers has added even more to the Model D's workability. It now offers a new 50 brake horsepower, "POWER-CRATER" engine; leaning front wheels* and power circle turn*. Yet the Model D's original cost is still only one-third that of a large grader, and operating, service and replacement part costs are proportionately low.

We invite you to talk with your nearby Allis-Chalmers dealer . . . compare values . . . and then ask for a demonstration. Only by watching the Model D at work can you believe that a grader costing so little will do so much . . . *for you.*

*Optional Equipment

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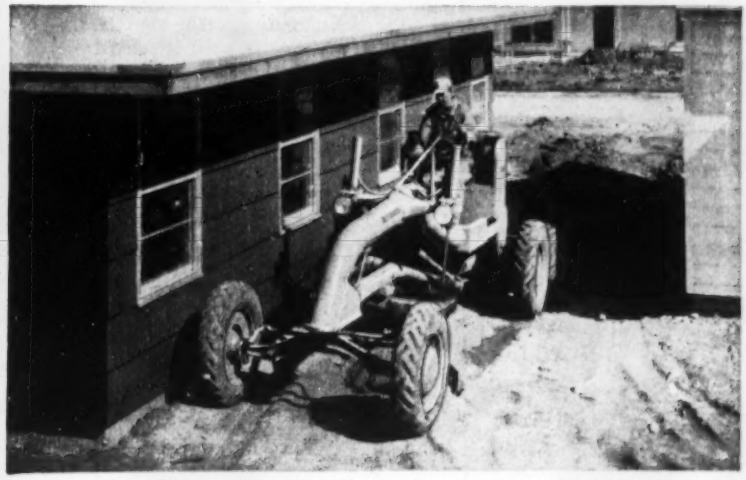
Cleans up, loads trucks with hydraulically operated rear-end loader . . . handles sand, gravel, dirt, any material with ⅝-yd bucket.



Close-quarter work is a snap. The Model D's power, traction and maneuverability let it handle landscaping, working between houses, and driveway construction, as well as rough grading.

Backfills fast, economically on trench or ditching projects. Can be kept busy on several jobs, travels from site to site at over 25 mph.

(*Advertisement*)

LETTERS from contractors—

Sirs:

We purchased our first Model D in July, 1952. We are called on to do almost every kind of job known to the industry from paving small private driveways and parking areas to the larger street and road jobs. We also do a lot of paving inside buildings such as garages and warehouses. We find the Model D will deliver the goods in close places and on small jobs with a minimum amount of hand labor which is the difference between profit and loss on most small jobs.

The maneuverability, operator's vision, and mobility of the Model D make it a money-maker on any job, large or small. We find the Model D ideal for curb and gutter excavation, cutting sub grades, working intersections, laying down cold-mix materials, spreading base materials and finishing.

We purchased our second Model D in June, 1953, because our first machine had proved to be such a good investment. The Model D's do seventy percent of all our grader work, at our initial investment of about one-third that of the large machine. Our operating costs, fuel and repairs on the Model D's are less than one-third that of the large machine.

HUGH HANLEY
Norris-Hanley-Norris
General Contractors

Sirs:

On May 16, 1952, I took delivery on my Model D and in my opinion there is not a better machine built for small grading work. For spreading rock and dressing up shoulders, it is a dandy . . . you get up on the shoulder and dress it up without any break, and when you get through your work is done. No going back to repair rough places made by a heavier machine.

This grader hasn't been in the shop since it was purchased. I can grease it all over in five minutes. I belive it has made many times what it cost me.

L. E. BUHLER
L. F. Buhler Construction Co.

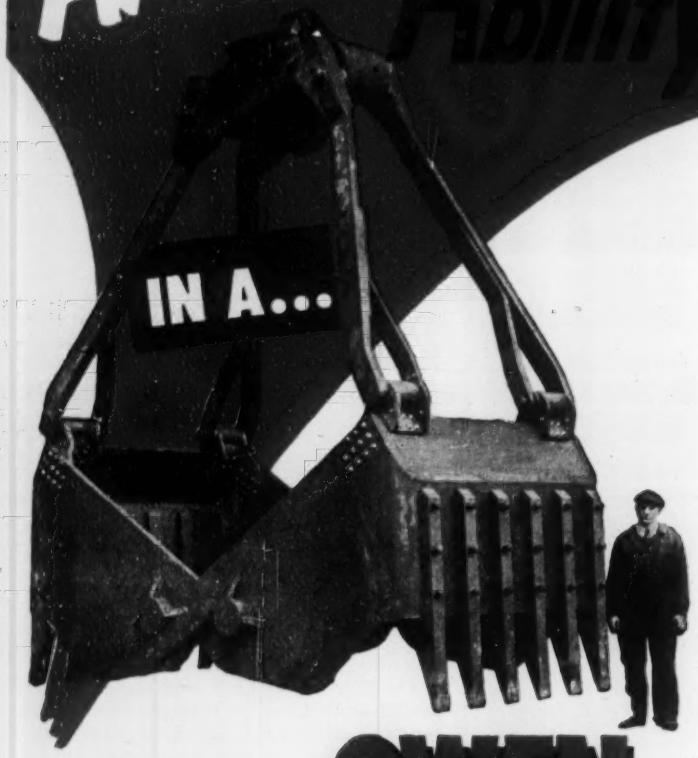
Sirs:

We are very pleased with our Allis-Chalmers Model D Motor Grader. This machine is being used to rough grade and finish grade streets and lots on our 75 acre development. Our area is exceptionally rocky, but we feel we have done big grader work with this machine. We believe this is the toughest machine for its size we have seen.

The "D" is outstanding in its ease of operation. Our operator says he has excellent visibility at all times. It is economical to operate and has worked very satisfactorily.

I. J. MAY, *President*
Southwest Development Co.

AMPLIFIED Ability



• 13 TON OWEN

The stresses and strains to which especially large machines are subjected are more than proportionally greater than machines of conventional size. Proper designing challenges the knowledge and skill of the engineer.

An interesting example of skillful designing and sound construction is this 5 Cu. Yd. Owen Bucket built to handle dredging of large blasted rock.

In general design and principle of operation it is typically Owen. But it has two main shafts to cover an unusually large area when open, teeth almost as large as a man and increased power sufficient to fully utilize its tremendous capacity.

If you have an uncommon need you can depend upon Owen to build a special bucket that will render the same satisfactory service you have long enjoyed from standard Owen Buckets.

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THE OWEN BUCKET CO.

6010 Breakwater Ave., Cleveland 2, Ohio

READER COMMENT

Bidding by engineers

SIR: Regarding this most interesting subject Mr. Lount (ENR July 8 p. 8) is absolutely right in pointing out that the bid buyer has no assurance whatsoever he will receive equal and equivalent service from each of his bidders, equally and legally licensed to practice engineering though they all be.

That fatuous belief—in equal and equivalent services—underlies the legal requirement for competitive bidding that exists at various places—South Carolina, Podunk County or what-have-you—and it is because of such erroneous assumptions that the purchasers frequently receive their just desserts: much more costly construction than necessary, so that the clever economies that have been effected by the purchase of low-cost engineering services are wiped out ten or a hundredfold.

On the other hand, for a country as vociferously devoted to competition and free enterprise as we are, we have an almost complete lack of direct competition in engineering projects. The engineering design is either socialized, as it is in the vast and preponderant amount of public work or it is monopolized as it is in the lesser amount of public work that is handled by private engineers. In either case, for one project there is one basic layout, perhaps provided with certain minor alternates, which presents the judgment of one man or of one group of men. This judgment may be the very best that can possibly be made concerning the subject at issue—or it may not be.

In either case, too, there is but one single layout that is subject to competitive bidding by contractors, whereas, at times, there may be great need for a second, third or fourth way of accomplishing the desired objective, each representing the best thinking of different men or groups of men. And that is the competition, the wholesome and salutary competition, that is so completely lacking in American engineering today.

How such competition can be introduced is a subject quite beyond the confines of a single letter in ENR.

For example, however, and as a tentative basis for consideration and argument, assume that in public bridge work, on all projects of greater than a certain estimated cost, it be made mandatory that basic loading and foundation conditions and mini-

(*Continued on page 14*)

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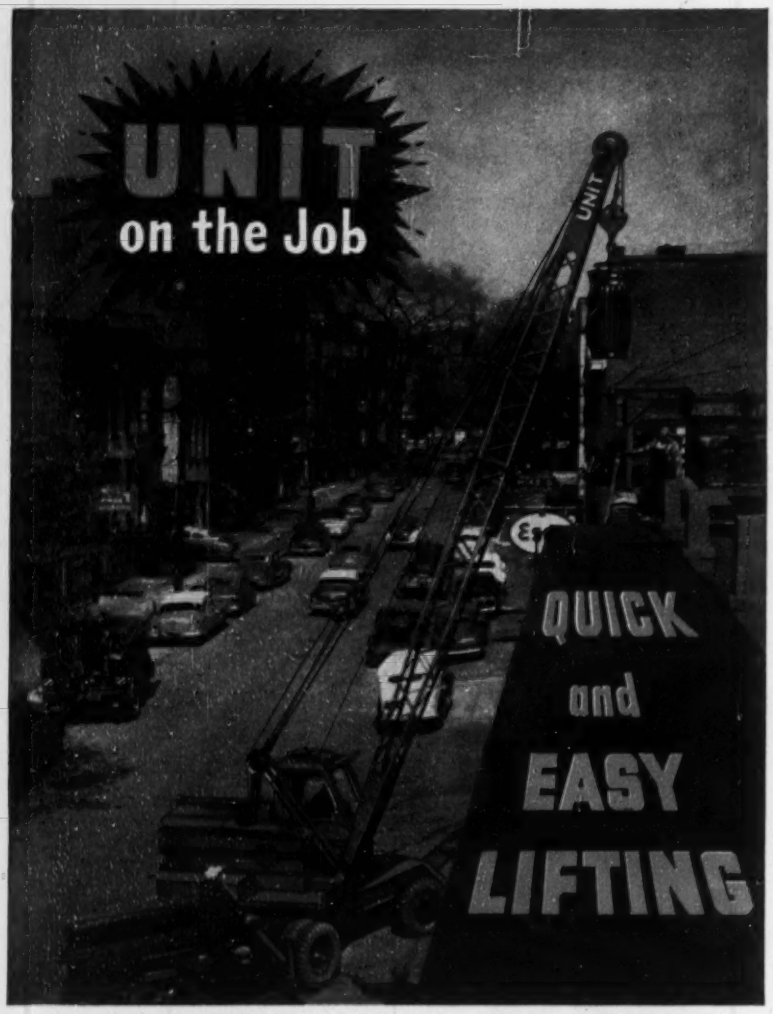

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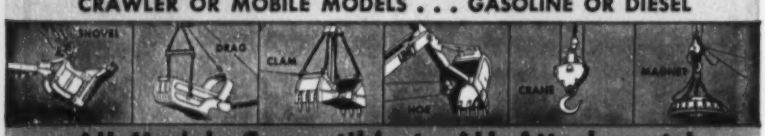


All Models Convertible to ALL Attachments!

READER COMMENT

mum clearances be set forth. And that contractors be invited to submit bids on alternate designs as well as on the basic official designs, which alternate designs would, of course, be subject to check and review before any possible acceptance.

Perhaps nothing better and more economical than the basic design can be devised. In that event, of course, no alternate proposals would be submitted.

On the other hand, and conceivably, bids on alternate designs might be submitted and be found as satisfactory and considerably less costly than the basic design.

In either case it is certain that engineering thought would be stimulated to a remarkable degree by such a procedure and that that the man of anguish, the taxpayer, would find something to become keenly interested in.

HOMER M. HADLEY
Consulting Engineer
Seattle, Wash.

Name omitted

SIR: Your issue of July 22nd carried on page 64, an announcement of the formation of "Iroquois Constructors Ltd." Although the first paragraph stated that "six of Canada's biggest construction firms have joined forces, etc.," only five were listed, the name of our Company having been omitted.

H. R. MONTGOMERY
Vice-President
Pentagon Construction Co. Ltd.,
Montreal

CALENDAR

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Saint Paul, St. Paul, Minn., Aug. 26-28.

American Society of Civil Engineers, hydraulics division, annual convention, Austin, Texas, Driskill Hotel, Sept. 8-10.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Illuminating Engineering Society, national technical conference, Chalfonte-Haddon Hall Hotel, Atlantic City, Sept. 13-17.

Western Association of State Highway Officials, Challenger Inn, Sun Valley, Idaho, Sept. 16-18.

Public Works Congress of the American Public Works Association, Claridge Hotel, Atlantic City, N. J., Sept. 19-22.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 21-23.

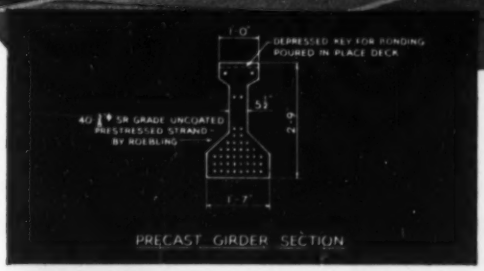
Southeastern Association of State Highway Officials, annual meeting, Andrew Jackson Hotel, Nashville, Tenn., Sept. 28-30.

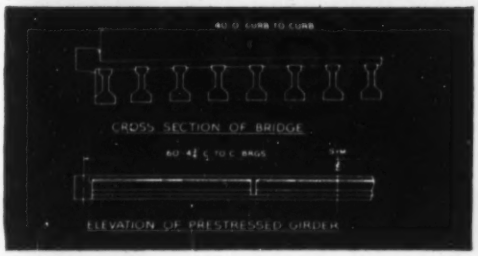
Standards Engineers Society, annual meeting, Haddon Hall, Atlantic City, N. J., Oct. 1-2.

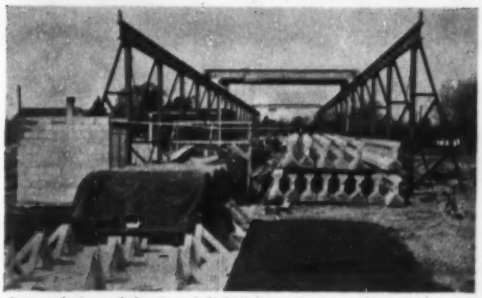
New England Water Works Assn., Poland Spring, Me., Oct. 4-6.

NOW! 8 PRESTRESSED CONCRETE BRIDGES FOR NEW JERSEY'S GARDEN STATE PARKWAY

Being lifted into place is one of the prestressed concrete girders produced by The Formigli Corporation. Overpass spans vary from 40 to 60 feet.


DEPRESSED KEY FOR BONDING POURED IN PLACE DECK
40 ½" SR GRADE UNCOATED PRESTRESSED STRAND BY ROEBLING
PRECAST GIRDER SECTION





General view of the Formigli 320-foot prestressed concrete casting bed. At right are inverted "T" girders awaiting delivery.

THE FORMIGLI CORPORATION, Berlin, N. J. recently cast prestressed concrete beams for eight overpasses* on Section 11 of the Garden State Parkway near Atlantic City. Production in the 320-foot casting bed was 160 linear feet of prestressed members per day – the pouring being done on one day and the steam curing on the next. The tensioning elements were Roebling ⅜-inch diameter, 7-wire stress-relieved Prestressed Concrete Strands and the maximum initial prestressing force was 240 tons.

For years, The Formigli Corporation has produced precast concrete members. To broaden its market, the pretensioning bed and post-tensioning system were added recently, and the Garden State Parkway job was its first in the pretensioned field. Prospective business includes prestressed building girders, floor and roof deck members, and spans beyond the reach of the Corporation's well-established line of precast reinforced members.

Roebling engineers, who have pioneered in the development of prestressing techniques and tensioning elements in America, are always ready to offer suggestions to help assure best results on any specific prestressed concrete applications. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

*Designed by Gannett Fleming Corddry & Carpenter, Inc., Harrisburg, Pa.; General Contractors, A. J. Groves & Sons Co., Minneapolis, Minn.

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cut, bent and tagged
...delivered
ON SCHEDULE

Any job—large or small—moves ahead more smoothly when you depend on Ryerson for reinforcing steel. That's because Ryerson deliveries are absolutely dependable. You set the schedule—we meet it, with steel that's accurately cut and bent—permanently identified by metal tags which can't tear loose.

Even when your job jumps ahead of schedule, large Ryerson facilities enable you to keep crews steadily supplied with steel. But you won't be hampered by costly rehandling of next week's steel piled up on the site.

Ryerson high-bond type reinforcing bars are specially designed for greater grip—guaranteed to meet or exceed ASTM spec. A.305. And Ryerson stocks also include wire mesh, structural steel, floor plate, etc. One contract can cover all your steel requirements.

So for dependable service on re-bars and every type of construction steel, contact your nearby Ryerson plant.

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA
CHARLOTTE, N. C. • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO
MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

CONTRACTS FOR TVA?—Nomination of Brig. Gen. Herbert D. Vogel to head Tennessee Valley Authority threatens to reopen the force account vs contracting controversy for big TVA power projects. Vogel told the Senate committee hearing on his confirmation that he favors contract work as a more democratic way of handling construction. No inherent objection to force account work, he said, but he thinks contract is more satisfactory. TVA will employ 13,400 construction workers this year—nearly all of them under force account procedure.

BUDGET PARING—While the government is following its "nudge" policy of placing as many orders as possible early in 1955 fiscal year (which started July 1), it may be harder to get government contracts later on. A "confidential" order has just gone out from Budget Director Roland Hughes to the heads of all federal agencies, asking them to reduce their spending during the second half of the fiscal year. That's the first half of the calendar year 1955. The purpose is "to permit smooth transition to the proposed lower levels for fiscal 1956."

MAPPING SQUABBLE—A step has been taken toward solution of that California squabble about unlicensed photogrammetrists (ENR Mar. 4, p. 26). According to a legislative committee studying the problem, aerial mappers should be exempt from registration law provisions if the mapping doesn't involve property-line determinations. Last winter payments for $300,000 worth of photogrammetry contract work were delayed by protests of licensed civil engineers and land surveyors, who claimed that all aerial map making by photogrammetry must be supervised by registered engineers. The mapping contractors awaiting payment did not have California-licensed men on their supervisory staffs. Payments later were made, but the sore spot persisted, resulting in continuance of the legislative study. The committee will recommend to the legislature next January that the State Civil and Professional Engineers Act and the Land Surveyors Act be clarified to exempt photogrammetrists.

COOLER TECOLOTE—Probably the world's hottest tunnel job—Tecolote Tunnel in the Cachuma Basin project near Santa Barbara—is cooling off.

What's happened is that tunnelers apparently have worked through the worst of the seamy rock strata where they hit huge streams of water at temperatures ranging up to 116 deg. F that required such measures as bringing men to the job in water-filled mine cars (ENR June 17, p. 45).

The crews now have reached hard, dense sandstone, clear of fissured strata, and have abandoned their precautionary probing ahead of main tunnel work.

Prefabrication COMES OF AGE!

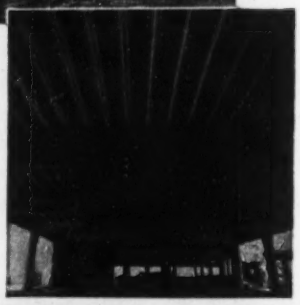
218 Precast, Prestressed Deck Girders, with Spans up to 63', Factory-made for Garden State Parkway Bridges

• Precasting continues its rapid spread, as today's building costs intensify the quest for sound economies. The range of concrete prefabrication is greatly widened by prestressing, which makes possible lighter members and longer spans, for buildings and bridges, with substantial savings in concrete and steel. Prestressing is really pre-testing, because a member is subjected to greater loads in fabrication than it takes in the field.

Factory-made, prestressed deck girders, 218 in number, up to 63 ft. in length, for eight bridges on New Jersey's Garden State Parkway, highlight this trend. Designed by GANNETT FLEMING CORDDRY & CARPENTER, INC., Harrisburg, Pa. and manufactured by FORMIGLI ARCHITECTURAL STONE CO., Williamstown Junction, N. J., every member is field practical, for fast erection with minimum supervision.

Cost in place invites comparison . . . inherent resistance to fire, weather, rust and rot, with no painting and little or no maintenance, mean further economies . . . marking the coming of age of concrete prefabrication.

For school and residential, commercial and industrial construction, factory-made concrete columns, spandrel beams, girders, roof slabs, provide fire-safety, structural stability and pleasing appearance of concrete, at marked cost advantage.



ASSEMBLY-LINE METHODS speed production in 320'-long pretensioning bench at Formigli's Williamstown Jct., N. J. plant, where 5 bridge deck girders were cast at a time and steam-cured. Facia members were post-tensioned at Formigli's Berlin, N. J. plant. 'INCOR'* 24-HOUR CEMENT produced 4000 psi stripping strength in 18 hours, setting tempo of operation, assuring maximum output at minimum production cost . . . with high ultimate strength and durability, hallmarks of America's FIRST high early strength portland cement. *Reg. U.S. Pat. Off.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

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WASHINGTON OBSERVER

Eisenhower's $50-billion highway program is moving ahead faster than expected. At the time the plan was proposed to the Governors Conference (ENR July 22, p. 21) many thought it was just a political gimmick that might never come to pass.

But White House pressure already exerted shows the Administration means business. The governors' seven-man committee met at the White House this week. This group favors returning gas taxes to the states, and they claim that with this revenue back in their hands they could do an adequate job. They do admit they couldn't come close to the building program the President says he wants.

State highway officials are being consulted, too. They go along with the President's thinking on highways. They're strongly for federal aid, and would be for increased federal aid, regardless of the gas tax issue.

Other industry groups are taking the program seriously. The U. S. Chamber of Commerce, for instance, has assigned two committees to come up with a new policy the chamber can back. Transportation members favor returning the gas tax to the states; construction representatives will go along with increased federal aid. The two will come up with a report before the end of the year.

Pushing the project for the Administration is Eisenhower's chief of staff, Sherman Adams, and Commerce Secretary Weeks. They're making sure that studies of the Bureau of Public Roads ordered by Congress tie in with the President's ideas: one will analyze highway needs, another will survey new ways of financing construction. They're supposed to be ready shortly after Congress comes back in January.

The Administration is insisting on keeping the gas tax to insure bigger federal aid on highways. Eisenhower will favor federal grants paying a larger share of costs, may even favor some kind of federal aid for toll highways. His program is expected to be put into legislation form sometime in 1955.

•

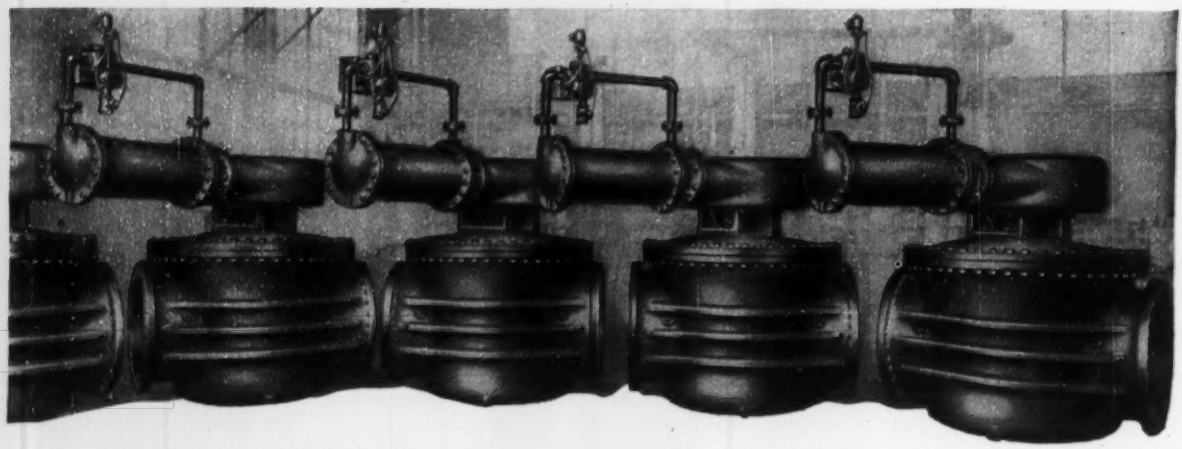
Commerce Undersecretary Murray is opposed to the Administration's highway plans and will leave the department before long. He is head man for transportation under Weeks, but he favors turning gas tax revenues and highway construction back to the states.

Another resignation on policy differences: Adm. J. F. Jelley who has headed up construction division in the office of Assistant Secretary of Defense Franklin G. Floete. Floete has his own ideas about coordinating construction activities of all the services, and wants a civilian in the job. Jelley is a veteran of Navy's Bureau of Yards and Docks, and he either returns to the bureau, or may retire.

Other construction men leaving government jobs: Deputy Undersecretary of Commerce Charles H. Dearing, also is resigning; he'll go back to the Brookings Institution . . . Capitol architect David Lynn is leaving after 53 years of government service during which he supervised construction of new Supreme Court building, new House office building, and other Capitol Hill projects.

•

Atomic Energy Commission reports big expansion of mills needed to process uranium ore. New plants will handle the big increase in uranium ore production that has developed on the Colorado plateau in the last six months. Private companies as well as the government have construction programs under way.



36" CONE VALVES *with clear* OPENING

. . . 52 of these
CHAPMAN
Automatic Cone Valves supplied for TVA

To supplement its hydro-electric power, TVA has built a series of steam plants on the Tennessee and Ohio rivers. These new units will furnish power required for Atomic Energy and other projects.

In this vital program, 52 Chapman Automatic Cone Valves were utilized for these plants . . . to act as check valves on the condenser water pumps. Each of these valves weighs approximately 11 tons.

Chapman designs and builds these valves in a range of sizes from 6" to 48" for check, throttling, pressure reduction and stop valve service. This is only one of many special Chapman valves. Remember, there's no problem in flow control that's too big or too tough for Chapman. That's why it saves time and money to *check with Chapman first, every time.*

The CHAPMAN VALVE

MANUFACTURING COMPANY

INDIAN ORCHARD, MASSACHUSETTS

BID OPENING—More than 100 construction men were on hand when J. Burch McMorran, chief engineer of New York State Power Authority, read off bids for the first St. Lawrence construction.

Work starts on St. Lawrence power project

The $600-million St. Lawrence International Rapids power project moved into the field this week with groundbreaking ceremonies that followed close on the heels of bid-taking for the first construction contract.

It is only a small contract, as major-project contracts go, but some of the biggest guns in the construction industry were trained on it.

Reputedly estimated at $2.5 million, it covers stream diversion, cofferdams and excavation for the first stage of Long Sault Dam, one of three major structures in the project. The contractor who bagged this job, however, would gain the advantage of being on the ground when subsequent work came up for bids.

• **Big crowd on hand**—At target time—10:30 EST last Friday—more than 100 contractors, subcontractors and suppliers crowded a small room at 270 Broadway, New York City, headquarters of the New York State Power Authority, licensee for the U. S. share of the work.

J. Burch McMorran, NYSPA chief engineer, unlocked the box containing sealed bids, asked whether there were any more (there were none), and commenced reading the totals.

Dravo Corp., Pittsburgh, Pa., was low at $1,913,250, having bid on an alternate calling for steel sheetpile cellular cofferdams. The other alternate contemplated a series of rockfilled timber cribs. Among 14 bidders, only three bid on the timber cribs, and two of these bidders also submitted lower bids on the sheetpile cells.

High bid was $4,989,700 by J. Rich Steers, Inc., of New York. Second and third were Savin Construction Co., East Hartford, Conn., ($2,341,000), and S. J. Groves & Sons Co., Syracuse, N. Y. ($2,593,800).

Bid totals were almost anti-climactic in some cases when they were called out after the reading of the long list of names of the joint venture bidders. The longest list included Walsh Construction Co., B. Perini & Sons, Inc., Morrison-Knudsen Co., Inc., Peter Kiewit Sons' Co., Utah Construction Co., Delta Constructors, Inc., Northwest Dredging, Ltd., B. B. & M., Ltd., and Slattery Contracting Co.—seven U. S. firms with headquarters as far apart as San Francisco, Calif., and Framingham, Mass., and two Vancouver, B. C. firms.

Their bid was $2,872,639.

A West-Coast joint bid came from Henry J. Kaiser Co., General Construction Co., Shea Co., and Pacific Bridge Co. It was $2,971,850 on the steel-cell cofferdam combination and $3,755,750 on the timber-crib alternate.

The other timber-crib bid, $3,540,250, was made by Raymond Concrete Pile Co., jointly with A. S. Wikstrom Co., Inc. Their steel alternate total was $3,514,800.

Award of the contract to Dravo is likely to take place this week, probably shortly after the Aug. 10 (Tuesday) ground-breaking ceremony. The ceremony, held near Massena, N. Y. and Cornwall, Ont., is sponsored by NYSPA and the Hydro-Electric Power Commission of Ontario (HEPC), which is the construction agency for Canada's half of the International Rapids project.

• **Bond issue planned**—Temporary financing for the U. S. portion got under way in June when NYSPA borrowed $40 million at 1½% on a short-term basis. This amount will be repaid out of the proceeds of a $315-million revenue bond issue that is planned.

NYSPA will perform somewhat more than half of the actual construction. Transfer of funds from HEPC is planned in order to effect the 50-50 distribution of costs. Actually the distribution will not be necessarily even, because each agency will buy its own power generating equipment.

Barnhart Island power plant, scheduled to begin producing electricity in 1958, will contain its full 32 generating units by the end of 1959. Sixteen

. . . St. Lawrence power

will be on the U. S. side of the mid-St. Lawrence International Boundary and 16 will be in Canada, each group of 16 being installed by its respective owner agency. Total generating capacity will be 1,880,000 kw of which 1,400,000 kw will be firm. The power plant will extend 3,200 ft between the island and the Canadian mainland.

Initial Canadian construction will consist of two cofferdams, one 500 ft long and one 4,500 ft long, aiming at unwatering the site of Barnhart Island Power Plant. HEPC has called for bids on these cofferdams to be submitted Aug. 24.

Long Sault Dam, which launches the NYSPA program, will regulate the pool at the power plant. It will stand in a channel between Barnhart Island and the U. S. mainland. The third principal structure is Iroquois Dam, about 25 mi up-river from Barnhart Island.

Here is the way Canadian and U. S. construction contract estimates compare at the three major sites:

- Barnhart Island Power Plant—U. S. $121.5 million; Canada $100.9 million.
- Long Sault Dam—U. S. $37.9 million; Canada $2 million.
- Iroquois Dam—U. S. $11.4 million; Canada $17.3 million.

Iroquois Dam, located near a natural rock weir that influences Lake Ontario levels, will replace the rock weir. It will control the admission of water to the pool above Barnhart Island Power Plant and Long Sault Dam, and it will stabilize Lake Ontario levels. Present plans, on which NYSPA's license was granted, call for a curved dam with side-channel dikes, as shown on the sketch. It is likely that this dam will become a straight one, a short distance downstream at a more economical site.

• Power work affects Seaway—Although the power project is separate from the St. Lawrence Seaway—the latter will be handled by the two nations' federal governments—features of the power project inevitably affect the Seaway. Moreover, coordination with Seaway agencies will be important and necessary throughout the construction period.

Seaway location, still subject to settlement between the two countries, will have no significant effect upon the financial feasibility of the power project, according to Robert Moses, chairman of NYSPA. On the other hand in a report issued this week by NYSPA it is stated:

"Regardless of location, the slack water pools and the deep channels created by the power project will greatly assist the navigation project."

• To prevent ice jams—In addition to the three major structures, the power project includes channel improvement work: $69 million worth by NYSPA and $22 million by HEPC. From a power standpoint, the function of channel improvement will be to aid ice control by inducing low, uniform water velocities approaching the dams. Surface velocities below 1½ mph will allow formation of a solid sheet of ice in the winter, preventing the harassment and danger of ice jams at dams.

First-stage work at Long Sault includes an upper and lower cofferdam between the mainland and the lower tip of Long Sault Island, unwatering between the cofferdams, excavation for about one-third of crescent-shaped Long Sault Dam, excavation of a diversion channel across Long Sault Island, and a bridge across the diversion channel. Quantity estimates and unit prices for the first two bidders (Dravo and Savin), are given on this page.

• More work coming—NYSPA says that contracts for highway and railroad relocations will be let next, sometime in the fall. The contract breakdown has not been completed, but spring and summer next year appear to be the seasons of greatest contract-letting activity. Construction of major features (both agencies) is scheduled as follows:

• Barnhart Island Power Plant—Cofferdams, seasons of 1954 and 1955; excavation, complete in 1955; concrete, July 1955-March 1958; dikes, seasons of 1955, 1956, 1957; equipment, mid-1956 to mid-1959.

• Long Sault Dam—Cofferdams Aug. 1954 to April 1955, and Feb.-Oct. 1956; diversion cuts, Aug., Sept., 1954, and March 1955 to March 1956; excavation, Nov. 1954 to Dec. 1955, and Nov. 1956 to July 1957; concrete, Aug. 1955 to Feb. 1956, March 1957 to March 1958, and May, 1958 to Nov. 1958.

• Iroquois Dam—Cofferdams, spring 1955, and season of 1956; excavation, April-Dec. 1955, and Dec. 1956 to June 1957; concrete, Oct. 1955 to June 1956, and April 1957 to Aug. 1957.

Channel improvement will take place during the construction seasons of 1955 through 1958. Dry excavation and dredging will be let separately.

Among the project's total quantities, as announced by NYSPA, are 31,000,000 cu yd of earth and rock excavation under water. This is part of an overall total of 86,000,000 cu yd. Embankments and cofferdams will take 19,000,000 cu yd of earth and rock, and dams will contain 3,000,000 cu yd of concrete.

Field engineering will be performed for NYSPA by consultants, Sanderson and Porter, Inc. and Uhl, Hall and Rich, both of New York. The latter are directors of the Boston firm of Charles T. Main, Inc. HEPC is using its own engineering force.

Long Sault unit prices

1	Dravo Corp., Pittsburgh 25, Pa	$1,913,250
2	Savin Constr. Corp., E. Hartford, Conn	2,341,100
14	J. Rich Steers, New York, N. Y.	4,989,700

Bids: 8-8-54 Item	Unit	Quantity	Unit Prices 1	2
Schedule No. 1				
Cut "C" exc div chan & trsp to dispos area:				
Com	cy	215,000	$1.00	$1.20
Rock	cy	1,000	30.00	6.00
Exc uncl, br	cy	250	10.00	15.00
Conc cl 1A, bridge piers	cy	210	90.00	95.00
1, br abutments	cy	50	90.00	95.00
Reinf bars, br, f&p	lb	20,000	0.17	0.15
Str stl, br & erect	ton	100	280.00	400.00
Untreat timber & lumber, br, f & erect	Mfbm	55	350.00	350.00
Cut "G" exc & trsp to emb or dispos area, com	cy	535,000	0.60	1.10
Rock	cy	1,000	30.00	5.00
Exc, common, dam fndn	cy	130,000	0.90	2.40
Initial unwater, cofferdm	ac f	350	165.00	100.00
1,000 gpm units, perm unwater sys, f & instl	ea	5	3,000	8,000
Unwatering	ac f	6,000	4.00	2.00
Exc, uncl, shore fills	cy	15,000	3.00	1.30
Earth fill, embankments	cy	60,000	0.20	0.50
Shore fill, f&p rock fill	cy	25,000	3.00	3.355
Riprap	cy	2,300	5.00	3.50
Exc earth in borrow area & transp to shore fills	cy	10,000	0.50	0.80
Schedule No. 3				
F&p stl sht pile, cofdm cls	ton	4,050	165.00	180.00
Cell fill in pile cells	cy	98,000	2.00	1.00
Sand & gravel blanket, stl sht pile cells	cy	14,000	1.30	1.40

U.S. moving fast to build huge radar net

Exclusive ENR report shows construction cost of bases will amount to $750 million

Guarding the United States against surprise air attack is a Herculean undertaking. And to many both in and out of the military it has seemed an almost impossible task.

But for the last five years the Air Force has quietly been spinning a vast and invisible web from San Diego northward to Seattle. From there the silent barrier guards the northern approaches of the United States along the 49th parallel eastward to Maine—then southward past the tip of Florida.

This web—the radar net of the Air Defense Command—will cost this nation by 1957—in construction alone—upwards of $750 million. It represents an investment of about 10% of all of the money that the Air Force has had to spend in all of its construction throughout the United States and at all of its overseas installations.

This year, its construction program contemplates an expenditure of $110 million with which Air Force will enlarge and improve facilities at 69 existing radar installations and build 485 new radar warning installations across the nation. To get this program under way by the end of the year, the Air Force has asked for immediate appropriation of $65 million.

At sea . . .

Unique in this aircraft warning system is what the Air Force has dubbed "Texas Towers."

These will be huge platforms built at sea off the Atlantic Coast as far out as 125 mi. Idea for the towers was borrowed from the oil companies operating oil rigs in the shallow waters of the Gulf of Mexico. The Atlantic coastal waters are shallow, too, and contain many shoals. On these shoals the permanently anchored platforms and towers will be built northward from Norfolk, Va., to Newfoundland.

Actual design of the platform and tower is still under study, but Air Force installations officers know that they will have to include at least a 15,000-sq ft area, and unofficial estimates are that each will cost upwards of $750,000.

Whether the platforms will be square, rectangular, triangular or "T" shaped depends upon the particular shoal construction site.

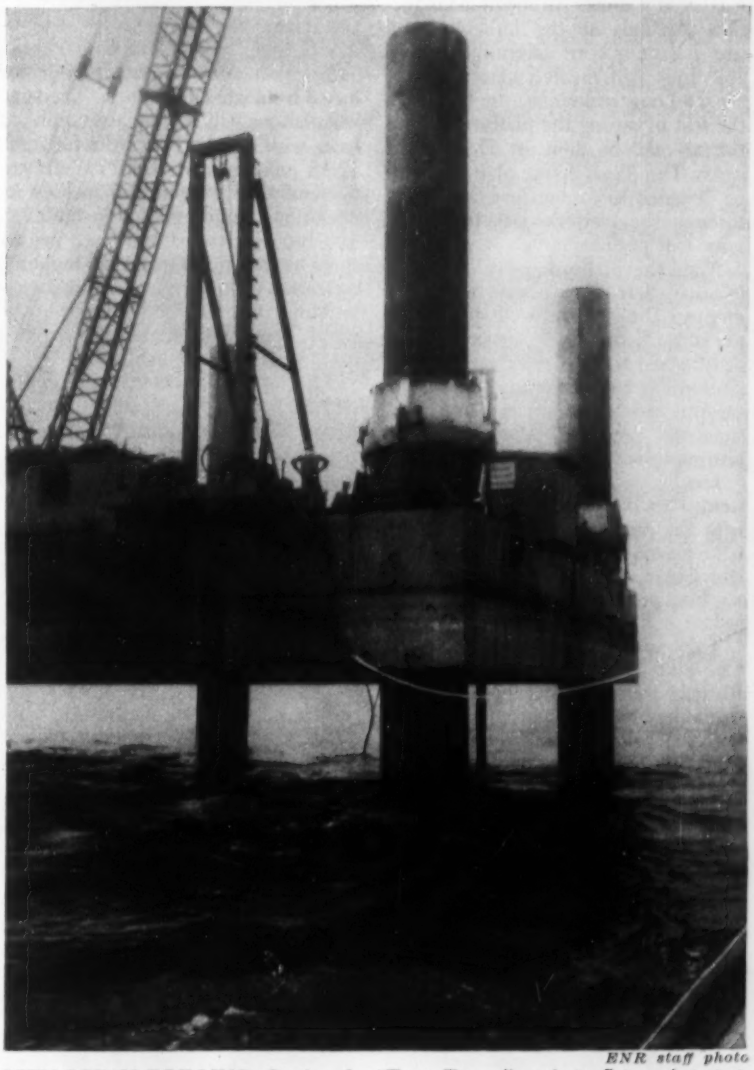
Each platform will contain complete living quarters for 20 to 30 operating personnel, including sick bays, kitchens, recreational facilities, maintenance rooms, etc. The tower itself will greatly resemble the conventional lighthouse tower except that the top will contain a small observatory with powerful radars and weather reporting equipment. The main platform also will contain sufficient space for a heliport, as these sea bases will have to be served by helicopter.

Each station will be completely self-sustaining and will generate its own electrical power for radar and radio. The stations will be linked by radio with shore-based inland radar aircraft warning systems.

• **Work starts**—At the present time, the Air Force, through the Navy's Bureau of Yards and Docks, has a contract with DeLong Engineering and Construction Co., and Raymond Concrete Pile Corp., both of New York, to make core borings for site investigations at various points in the Atlantic Ocean.

Site investigations have been under way for about a month. To provide a stable drilling platform in the open ocean, DeLong and Raymond are using an Army-owned barge-dock of the type developed by DeLong (ENR May

(*Continued on page 24*)



ENR staff photo

OPEN-OCEAN DRILLING—Getting the "Texas Towers" project off to a fast start, the Department of Defense has been conducting core boring tests of possible sites in offshore Atlantic shoal waters for the past month. Drilling platform is barge-dock developed by one of the drilling contractors, DeLong Engineering and Construction Co. Raymond Concrete Pile Co. is the joint venturer. Water at site pictured above is 55 ft deep, being in the comparatively calm lee of a tide rip caused by shallower water.

. . . Huge radar net for defense

29, 1952, p. 44) for quick installation at out-of-the-way places. Towed to a proposed site, it drops its legs or caissons to the bottom. Jacks in the caissons push downward, raising the barge clear of the water. Form borings are made with rigs fixed at the barge-dock's four corners. It takes four days to complete borings at each site.

Construction of the permanent platforms will be completed on shore by private contractors under competitive bidding. Then the entire structure will be towed barge fashion to its location at sea and raised out of the water to a pre-determined height.

• **How it's done**—Although construction methods at the individual sea sites have not been determined, probably they will involve adaptations of the DeLong technique. In this case, the feat of raising the platforms above the sea will be done by DeLong air jacks. The Texas tower platforms will be designed to contain several "wells" through the platform structure, each some 6 ft in diameter.

After the platform is at its proper location, 6-ft dia caissons would be dropped through the wells to bed on the ocean floor. Then, air jacks would be attached to each caisson to lift the platform out of the water. Next, the caissons would be driven, one at a time, to adequate penetration and bearing values by pile drivers.

Finally, each caisson would be welded to the platform, cut off flush with the deck and covered by permanent flooring. (Control of these massive jacks is so sensitive that in the leveling process the platform can be jacked as little as ½ of an inch.)

Two firms, Anderson, Nichols and Co., and Moran, Proctor, Mueser & Rutledge, already have been engaged to prepare architectural and engineering data for the installations and Air Force expects that competitive bidding will be called for by December. Construction is expected to get under way in the spring of 1955. Total construction costs of the Texas towers will run between $15 and $20 million not including the specialized radars and other operating equipment.

On land . . .

• **Fill in land gaps**—Simultaneously with the Texas tower project, Air Force will begin to build some 485 new radar aircraft warning stations to fill in gaps in the already existing air defense radar warning network.

There are already hundreds of small permanent and semi-fixed radar warning stations strung strategically across the nation. So quietly has it been done that little attention has been paid to their construction. Just how many the Air Force won't reveal, but Air Defense officials believe it will be "adequate" when the new installations are completed in 1957.

• **485 stations**—The 485 stations to be built are of two general types—semi-fixed, and small automatic.

The semi-fixed stations will occupy some 40 acres of land each while the automatic stations will require only about one-half acre. The larger stations will be built at a cost of approximately $600,000 each, while the automatics will cost relatively little for construction. Land for the larger installations will be purchased, while land for the automatic radars probably will be leased from site land owners. The large installations will be miniature military bases with complete facilities for some 12-16 officers and 108-179 airmen. Generally the station will include an operations building, power building, two bachelor officer quarters, two or three barracks, post exchange building, recreation building, administration building, training building, technical supply building, mess facilities and motor maintenance facilities.

The automatic radars are referred to by Air Defense as "gap fillers" because their designed performance is to fill in the gaps—or blind spots—between the major radar installations. Radar beams move in a straight line and therefore cannot follow the curvature of the earth or clear obstructions in the path of the beams. So, the automatic radars, linked by radio with the main installation, guard the otherwise blank areas caused by earth curvature, hills, mountains, and buildings.

• **Pacific plans**—Along the Pacific Coast of the United States, coastal waters are deep and there are no shoals as are found in the Atlantic.

As a result the Air Force and Navy have had to rely upon aircraft radars located aboard so-called "picket ships." These picket ships are stationed far out at sea off the California-Oregon-Washington coasts to warn of unidentified aircraft approaches. In addition to the picket ships both services maintain flying radars, carried aboard huge transport planes. The aircraft range sometimes far at sea, sometimes close in, monitoring all aircraft flights approaching U. S. shores. These planes in effect also fill in the blind spots of the surface radars.

In addition to the warning radars of Air Defense in the United States, there is a continual exchange of aircraft identification data between the United States and Canada. This is maintained by the Canadian-U. S. "Pine Tree" radar warning system. Operated by the Royal Canadian Air Force, the Pine Tree system covers, in large part, the vast uninhabited area of central Canada. Heaviest complex, of course, guards approaches to the heavily populated areas of Canada's southeast.

Far North . . .

In the Far North, the United States Air Force, and presumably Canada, are installing secret automatic warning units which are said to relay by radio the approach, speed, direction, and altitude of any aircraft. These are then checked against flight plans of known aircraft in the area and, if unidentified, intercepts are made.

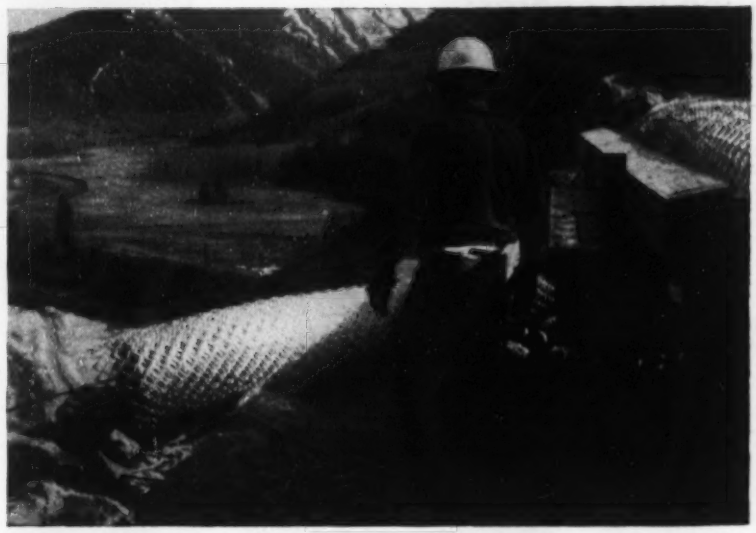
To link all of the giant multi-billion-dollar system together with anti-aircraft systems and weapons of the Army and the Navy, Defense Department has just ordered a unified command to be established at Colorado Springs.

• **New command**—The new and unified organization, named Continental Air Defense Command, has been assigned as a responsibility of the Air Force and placed under control of four star Gen. Ben W. Chidlaw. While the other two services retain operational control of their anti-aircraft devices, Chidlaw, in effect, becomes a "theater commander."

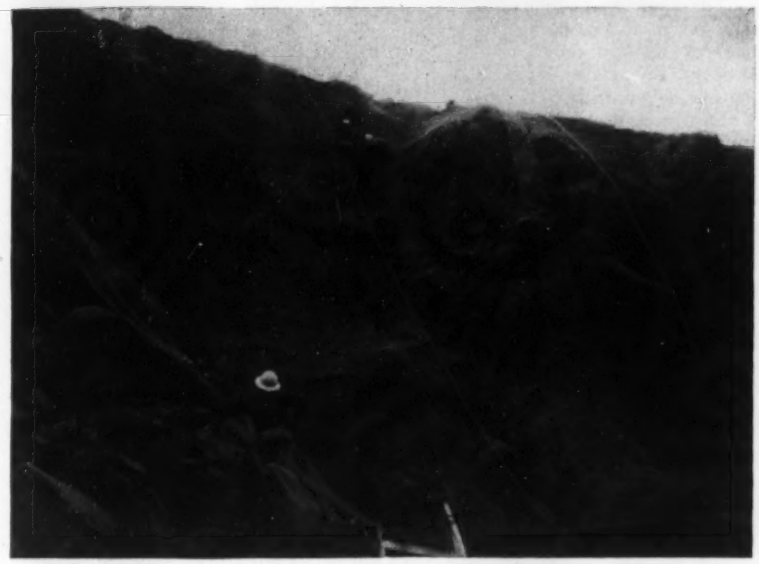
In operation, the aircraft warning systems of Air Defense Command would alert interception aircraft of ADC and possibly Naval aircraft, if unidentified approach was made across the ocean borders of the U. S. The warning radars also would feed intelligence to Army's guided missile magazines guarding the industrial complex of the nation. It would inform Nike installations of the approach, direction, speed and altitude of the unidentifieds. It also would keep the Nike installations informed as to what friendly intercepts were in the vicinity.

Specifically, in setting up the Continental Air Defense Command, the Joint Chiefs of Staff ordered that it provide for the development of coordinated plans and requirements for the air defense of the continental United States; that this command should be responsible for the effective control and utilization during time of emergency of all available military activities and forces necessary to defend the United States against air attack.

The new command, the JCS declared, also will provide a single military agency to coordinate with the Federal Civil Defense Administration and other defense agencies.



Fencing rolls down the mountain . . .



. . . to form retaining mat at damsite

Chain link fencing is used as a retaining mat to prevent landslides at the Palisades Dam project on the Snake River in Idaho (ENR Dec. 31, 1953, p. 28). During excavation for tunnel intake structures, landslides were frequent despite sealing operations. Dam engineers decided to install retaining mats to protect workers and equipment during construction and assure a free flow of water through the intake tunnels after the job is completed.

Cyclone Fence Division of U. S. Steel's American Steel and Wire Division won the contract for installation of the retaining mats. Holes eight ft deep and five in. in diameter were drilled at the top of the mountain to hold steel anchor rods which were cemented in place. A heavy steel cable was strung through each of the 15 rods, and the mats were laced in place with specially made pickets.

Workers then just rolled the fencing down the mountainside and secured it at the bottom in the same way. Distances from the top to the bottom varied from 50 to 100 ft. The retaining mat is over 400 ft wide. A total of 20,000 sq ft of fencing was used.

Sacramento canals

Tudor authorizes start on first section of big California water project

Start of construction was authorized last week for the first $7-million unit of the Sacramento canals in the northern sector of California's Central Valley. Acting Interior Secretary Ralph A. Tudor approved the starting of the 26-mi Corning Canal, to irrigate 35,000 to 40,000 acres of land along the west side of the Sacramento River.

Specifications will be completed by the Reclamation Bureau to permit a call for bids by Sept. 17 on the initial 7½-mi section of the Corning Canal. Some $2.5 million of appropriated money is available to finance the first year's operations. A pumping plant included in the initial unit will raise water from the river to the Corning Canal.

Ultimate development of the entire Sacramento canals project contemplates construction of a diversion dam and 166 mi of canals in all, at a total estimated cost of nearly $58 million. Future authorizations for additional segments depend on the creation of local water districts that will enter into repayment contracts with the Reclamation Bureau.

The proposed Red Bluff diversion dam would feed water into a longer gravity-flow canal. Neither the dam nor the canal will be built unless water districts are created.

But the Corning Canal unit is figured to stand on its own feet financially. Construction of the dam would lower the pumping lift for Corning from 72 ft to 55 ft, but the unit is economically feasible on either basis, according to Reclamation estimates.

Extension will add 33 mi to Pennsylvania Turnpike

The first half of the 33-mi Delaware River extension of the Pennsylvania Turnpike will be opened to traffic sometime this month. The entire extension is scheduled for formal opening Oct. 1, fourteenth anniversary of the Pennsylvania Turnpike.

The section to be opened this month is a 16.6-mi stretch between the Valley Forge interchange at King of Prussia and the Willow Grove interchange.

Completion of the extension will give Pennsylvania a 360-mi superhighway extending from the Ohio line to the Delaware River. A bridge over the Delaware River, now under construction, will connect with the New Jersey Turnpike. It is scheduled for completion in two years.

Split of reclamation bloc in Congress dims prospects for new construction

Congressional leaders are saying defeat of the Frying Pan-Arkansas project in the House is the heaviest blow at reclamation since President Theodore Roosevelt signed the original law in 1902.

Without a solid coalition of western states, reclamation forces have little hope of getting any sizable project through Congress. And the reclamation bloc split sharply over Frying Pan-Arkansas with the California delegation almost solidly against the bill.

The $172-million Frying Pan-Arkansas project brought on the first real showdown on reclamation since the Eisenhower Administration took over. Its defeat probably killed the last chance for congressional approval of the Upper Colorado River project—at least at this session.

The Administration, too, took a licking with the defeat of Frying Pan-Arkansas. The project had carried the stamp of Administration approval since June 1953. And worse still will be failure of Congress to approve the Upper Colorado project.

For the Upper Colorado project this year, the Administration tightened the financing requirements to eliminate all questionable features. In fact, the money policies laid down for Upper Colorado were good enough to win the tacit consent of the Hoover Commission, which made no official criticism of the bill.

Upper Colorado is the type of project that Administration policy makers have said should be built by the Federal government. It is too big for local interests to handle. GOP leaders banked on it as an answer to charges that the Republicans would never build another dam like Hungry Horse.

Playing a mighty role in killing Frying Pan-Arkansas was the well-heeled Washington lobby of the Colorado River Water Board of California, which is openly fighting Upper Colorado River development. Southern California's main source of water is the Colorado, and that area will continue to get more than the minimum allowed under the terms of the seven-state Colorado River Water Compact so long as there is no upstream development.

It is no secret that reclamation has survived through 52 years as a result of a series of political trades. The 17 western reclamation states, while low on House members, supply more than one-third of the Senate. Furthermore, until now, they have stuck together pretty well on questions involving water.

It has been common gossip during the current session of Congress that western Republican senators, particularly those in the five Upper Colorado River states of Colorado, Utah, Wyoming, New Mexico and Arizona, went along with the administration on the Tidelands and St. Lawrence Seaway project in turn for support for their Colorado storage project and Frying Pan-Arkansas.

Stymied at this session on the two projects, the Administration and Republican candidates in the West can do no better than tell the voters they will introduce and support similar legislation in the next Congress. That is the tack they will take.

The outcome then will be influenced by the reports of the Hoover Commission and its task force on water resources and power. The Commission is due to make a comprehensive report by the end of this year and a final report by May 31, 1955.

Some new ground rules may result for the reclamation program that has put 7,000,000 acres of new land under irrigation in the last half century. The program has been wobbly for some time because the best projects have been completed and the Reclamation Bureau has been digging deeper and using some questionable devices in the recent past to justify new proposals.

Upper Colorado is the first major effort of the new Administration to develop an economically defensible multi-purpose reclamation project. Next year will provide another test of those new standards and policies in the eyes of Congress and the Hoover Commission.

AGC in new move against bid shopping

The Associated General Contractors has taken action to strengthen and activate its own prescription for correcting the evils of bid shopping among subcontractors.

Last week the AGC released a new printed form of invitation to bid and urged its use by general contractors when inviting bids for subcontracts. The document states that the general contractor subscribes to the AGC code of ethical conduct, which specifically rules out the practices that make bid shopping possible.

Printed on the form are five pertinent rules of ethical conduct. Most important among these rules are the following:

- The figures of one competitor shall not be made known to another before the award of the subcontract, nor should they be used by the contractor to secure a lower proposal from another bidder.
- The contract should preferably be awarded to the lowest bidder if he is qualified to perform the contract, but if the award is made to another bidder, it should be at the amount of the latter's bid.
- In no case should the low bidder be led to believe that a lower bid than his has been received.

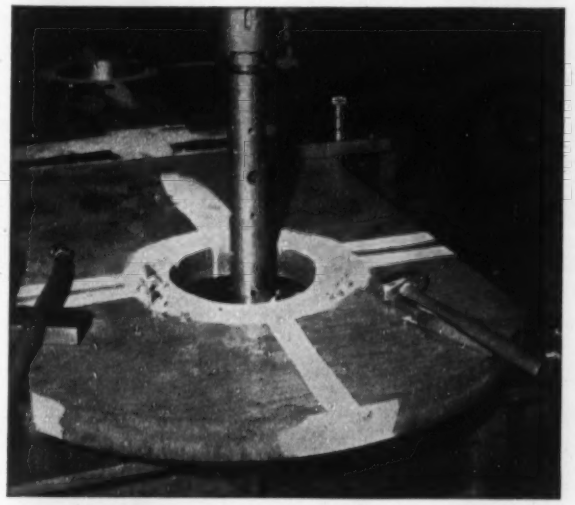
The AGC has contended all along that these abuses should be corrected by the industry and not by legislation.

Congress acts on construction bills

Several construction measures moved ahead in Congress last week.

- **Upstream flood-control**—Signed into law was a modified upstream flood prevention act that pretty well satisfies both the Department of Agriculture and the Army Corps of Engineers. In its original form last year, the measure would have built up the Soil Conservation Service of the Agriculture Department into a major construction agency for cost-sharing projects. As finally approved, the law restricts the area of watershed projects to 250,000 acres and limits the size of retention reservoirs to 5,000 acre-ft. In addition, any structure of more than 2,500 acre-ft must be approved by the Agriculture Committees of both houses before federal money can be voted.
- **Partnership project**—The Senate Interior Committee reported favorably the partnership bill for federal cooperation and financial assistance to two California irrigation districts in building the Tri-Dam project on the Stanislaus River. This bill faces tough sledding, but there is better than an even chance that the Senate will follow the House in approving the measure.
- **Reclamation projects**—Approved by the Senate committee was a House bill authorizing the $10-million Michand Flats project in Idaho. Less important was committee approval of another House measure that would authorize the Interior Secretary to report on four irrigation units being established in the Niobara River Basin in Nebraska, as parts of the Missouri Basin plan.

Burning the pin holes. Flame-cutting was also used to round the ends.



Boring the pin holes to finished size for 12-in. diameter hanger pins.

Planing the surface of the hanger to conform to angle formed between two connecting girders.

Bridge hanger-links show workability of this high-strength, low-alloy steel

The eight hanger-links for the Passaic River Bridge, on the New Jersey Turnpike, provide an excellent demonstration of the workability of high-strength, low-alloy Mayari R. Located at each end of the 990-ft continuous girder—longest ever built in this country—these hangers connect the bridge to the approach spans.

The hangers were fabricated of 3-in. Mayari R plate at Bethlehem's Pottstown, Pa., works. Flame-cutting was used to round off the ends. Holes for the 12-in. hanger pins were also cut by burning. They were then bored to exact diameter.

Planing came into the picture, too. Because of a slight curvature in the bridge, the adjoining girders came together at an angle of 1 deg, 5 min, 14 sec, which of course meant that the hanger pins had to be out of parallel. This made it necessary to plane the hangers in such a way that both the upper and lower portions would bear evenly against the respective girders.

All these operations were accomplished as readily with Mayari R as they would have been with structural carbon steel. And Mayari R can be worked easily in other ways, too—riveting, cold forming, hot forming, shearing, punching. Its use is spreading rapidly, as you will discover if you leaf through our new Catalog 353. Write or call our nearest office for a copy.

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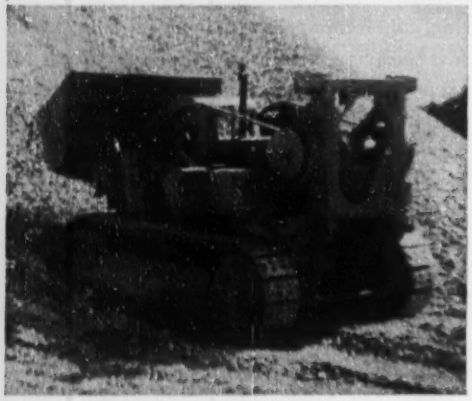
Mayari R *makes it lighter... stronger... longer lasting*

North Carolina clay is hard digging, yet an Eimco 105 with an inexperienced operator loaded 153 trucks in its first 8 hour day on the job. A conventional front end loader in the same price category with the same bucket capacity and under identical conditions using an experienced operator was only able to load 75 trucks in the same length of time. You too, can get twice the production for the same capital outlay by buying an Eimco 105.

On the Waldo grade north of San Francisco an Eimco 105 is used in the tunnel to speed up mucking. As the top is broken out to make way for the huge steel supports muck runs down into the two pilot headings where only 15-20 minutes mucking time is required for approximately 75 yards per side. Fast, small trucks carry the muck out to stockpile where the same 105 loads into large trucks during drilling cycle.



Stockpile loading into trucks in Massachusetts. Eimco 105's load rock, sand, gravel, slag, brick, clay or any other material and two speed discharge makes it possible to fill large or small trucks. Independent track operation provides unlimited maneuverability, simple controls make handling easy. Write for more details to The Eimco Corporation, Salt Lake City, Utah.

B-69

Seek injunctive action in picketing issue

A Jamestown-Olean (New York) teamsters' local has been ordered to show cause in U. S. Court at Jamestown as to why an injunction should not be issued to prevent the labor group from picketing construction sites.

The injunction order was requested by the National Labor Relations Board, charging that Local 649 of the Teamsters engaged in unfair labor practices by maintaining a secondary boycott of construction work being done in nearby Salamanca and Elicottville.

NLRB said the Olean Builders Exchange had brought the unfair practices charge after the union threw up picket lines May 17 at jobs of four contractors. The exchange charged that the local had not been certified as a bargaining agent for the men employed, and has been attempting to gain recognition as bargaining agent for construction workers by its tactics.

Challenge "outsider's" right to use "outside" labor

Whether an out-of-state contractor, operating with federal aid funds, must obey Idaho law relating to wage scale and employment of Idaho workers is the subject of court action, and inquiry by Idaho's attorney general and a congressman.

The Utah construction firm of La Grande Johnson is working on a $700,000 federal-aid highway project on highway 20-26 in the Atomic Energy Commission's road network serving the National Reactor Testing station near Idaho Falls.

Organized labor in Idaho has accused the firm of employing more Utah men than Idaho workers, and of paying wages that are not in accord with the wage standard prevailing in Butte County.

Idaho law says that projects backed by state funds must employ 95% Idaho residents and must pay the prevailing wage of the locality.

The Idaho Falls building trades council has sued the firm on charges of violating state labor laws. The state's attorney general, Robert E. Smylie, has promised legal assistance to the trades council. Republican Congressman Hamer Budge of Idaho's second district has asked the Atomic Energy Commission for an explanation.

The construction firm says that its project is financed mostly by federal funds and that it doesn't have to follow the state law as to percentage of Idaho workers employed. The firm also denies that it is paying substandard wages.

Members of the Idaho Falls building trades council are picketing the project, but peacefully. The work is continuing.

The trades council suit has been filed in Butte county district court, at Arco, Idaho. It is due for preliminary hearing early in August.

Prime contractor must pay for sub's negligence

In a jury verdict filed last month (July 7) in Los Angeles Superior Court, Robert E. McKee, general contractor, lost the second round in a construction worker's damage suit for injuries sustained while working for a McKee subcontractor. A motion has been filed by McKee's attorneys to bring the case up for a new trial.

At the time of the accident, Louis Dominick was working at a cement mixer on a runway which collapsed, causing injuries to his right foot. The mixer had been placed there by a subcontractor. Dominick's attorneys charged negligence on the part of general contractor McKee. The jury agreed, holding McKee responsible for safety of subcontractor's facility, and awarded Dominick $17,000 damages. He had sued for $125,000.

Piecemeal settlements mark California scene

Piecemeal settlements of wage negotiations in 11 southern California counties appeared to be ending the threat of a general building strike in the area last week.

Contractors—faced with a union demand that they deal separately with six basic trades instead of making an overall agreement with all 19 (ENR July 22, p. 27)—had feared that widespread strikes would result from confusion. They had also announced they would not retreat from a "final offer" of 10 cents an hour in wages and welfare. The unions demanded up to 25 cents an hour plus fringes.

But both sides retreated slightly, and some settlements had been reported this week.

Los Angeles bricklayers accepted a 22½-cent hourly wage increase to bring their pay to $3.40 an hour. However, contractors succeeded in excluding health and welfare provisions from the agreement.

Carpenters representing the 11 counties ratified an agreement for a 17½-cent package—7½ cents in wages and 10 cents for health and welfare.

Cement masons okayed an agreement for a 10-cent health and welfare package; laborers accepted a 2½-cent wage raise and 7½-cent health and welfare plan.

Negotiations were continuing with ironworkers and teamsters.

Labor briefs

• **Indict leaders**—Business agents of two locals at Joliet and Decatur, Ill., have been indicted by a Grand Jury at Springfield for alleged shakedowns of contractors as the price of labor peace. Indicted were: Virgil Floyd, of a teamsters' local at Joliet and Harry Meisenhelter of the Decatur laborers' group. Total fees extracted by the two men, the indictment said, were $5,950.

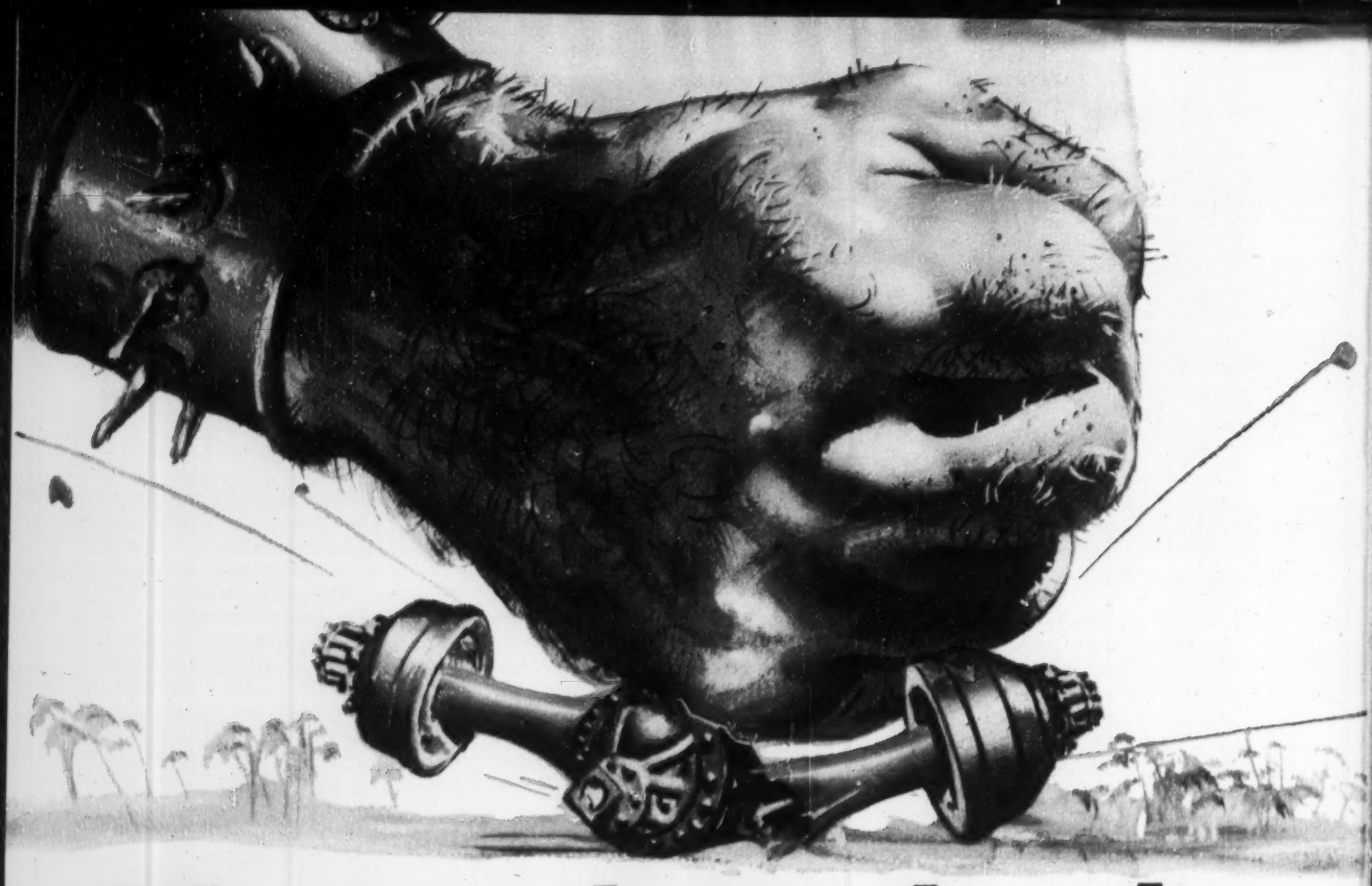
• **End walkout**—A two-week strike by laborers, bricklayers and carpenters in the Canton-Massilon area in Ohio ended with a 7½-cent boost for all concerned.

• **Colorado strike ends**—Operating engineers in Colorado ended a 23-day strike, accepting 7½ cents an hour from the Associated Building Contractors of Colorado, Inc. The union had demanded 25 cents an hour. The strike had tied up state highway construction and work on Denver's $12-million south Boulder Canyon Dam.

• **Raise for carpenters**—Youngstown, Ohio, contractors signed a pact with carpenters calling for a pay increase of 7½ cents an hour, plus 5 cents more next October. The raise brings rates for the trade to $2.95 now.

• **Accept Denver pact**—Denver ironworkers overrode their own negotiators and voted to accept a 17½ cents hourly package that ended their six-week strike. While pickets tied up construction of—among others—the Mile High Center, union negotiators had rejected an offer of the same amount. The 17½-cent package includes a 10-cent wage boost and fringes.

• **Urge work law**—Edward Colwill, Baltimore contractor, is heading up a committee seeking enactment of a right-to-work law for Maryland.



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It's calculated destruction! But we know, and can tell you in advance, that a Timken-Detroit axle can take a murderous beating on the job.

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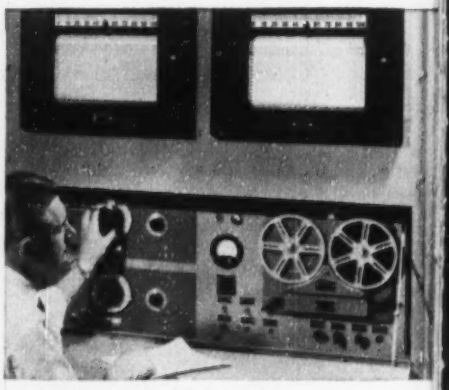
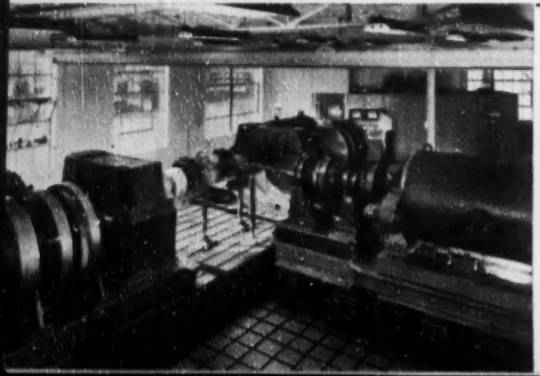
The result? You enjoy longer axle life; less maintenance, repairs and downtime; lower operating costs, higher profits. Good reasons why Timken-Detroit axles are the choice of the leading manufacturers and owners.



This is our "Torture Tester." He gives axles and gearing the works in the "Torture Chamber." Above him are graphs showing speed and torque performance under any conceivable operating condition. Soft ground . . . twisting roads . . . long grades or fast highway speeds. With special dials, recorders, and electronic devices he actually *drives* the axle with scientific precision—*from his chair!*



How TDA proves axle quality in this "Torture Chamber"

We take an axle out of stock . . . then run a test like twisting the axle shaft 14°, backward and forward—36 times a minute, 24 hours a day, days on end. Or simulate a chuck hole shock every 4 seconds, 24 hours a day for months. Even "bend test" an axle housing for 1,000,000 cycles.

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1. TDA two-speed double-reduction axles of Hypoid-Helical design provide both fast and slow ratios with two sets of "Man-Size" spur gears of liberal capacity. This simple design eliminates small, complicated arrangements of parts... improves performance... increases engine and gear life... cuts maintenance and repairs ... fewer service parts required.

2. You get INSTANT, easy shifts... fast to slow—or slow to fast.

3. TDA's wider range of gear ratios ... gives you combinations for any hauling requirement. For your present or new truck you can have a fast gear ratio for light loads everywhere—full loads on the level. Slow speed ratio for full loads on hills—for better pulling in "soft going." It all adds up to more profit per load and increased engine life.

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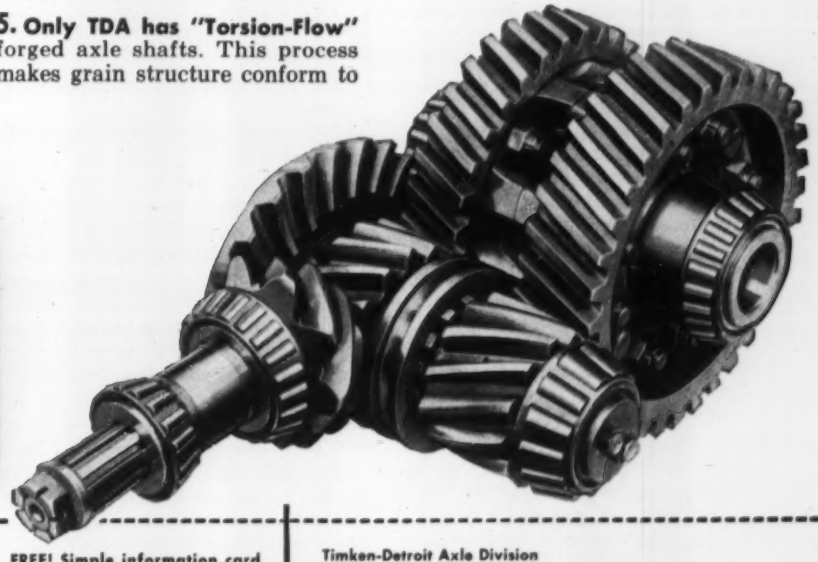
to bits



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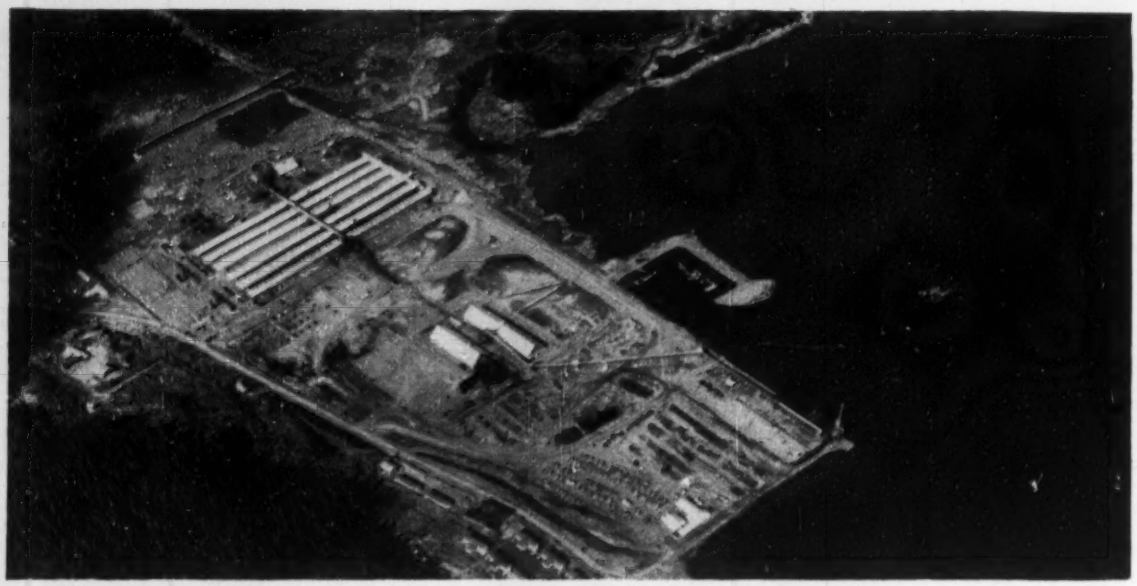


SIX POTLINE BUILDINGS house initial smelting facilities at Kitimat, B. C. The 1,000-ft long steel frame structures are appropriately clad in aluminum sheeting as are the two warehouses in the foreground and a half-million square feet of other buildings.

Kitimat construction pays off in aluminum

L. L. Wise
Associate Editor

After three years of intense construction effort, the Kitimat plant of the Aluminum Company of Canada, Ltd., is in operation: The first aluminum ingot was cast August 3, 1954.

Thus, one of the largest investments of private capital in construction history (the total will exceed $275 million by the end of this year) has come to fruition.

Much has been said about the dramatic hydroelectric development that is the principal reason for locating the new smelter facilities in the undeveloped area of the central British Columbia coast (see accompanying list of previous ENR articles).

But the huge high-level reservoir—together with the underground powerhouse and its system of tunnels—has virtually relegated to secondary consideration construction of the plant proper.

The contractor organization and Alcan Engineers have had complex problems. Aside from the precast wharf structure (ENR Jan. 14, 1954, p. 29), the most difficult technical problem was caused by fill settlement. Dumped rock and gravel together with dredged sand used to support elements of the works have compressed a deep strata, resulting in differential settlement. Yet to meet the time schedule, the structures and equipment had to be built and installed while the sinking continued.

Administrative problems have been almost as involved and as important as the technical details. These include organization of the unique eight-contractor group comprising Kitimat Constructors, builders of the smelter; the target estimate contractural arrangements between Alcan and the contractor; and the task of marshalling men, machinery and materials for a job to whose isolated location the writer can attest.

Also of importance at Kitimat is planning a community for an ultimate 50,000 people, and construction of initial elements of this town. This part of the job will be covered in a subsequent article.

• **Deep-water inland location**—Kitimat is located on a deep-water inland arm of the sea, 80 some miles from the Pacific Coast of Canada. This relatively level area near the mouth of the Kitimat River is virtually the only place on the British Columbia coast north of Vancouver suitable for an immense industrial works and its supporting community. A 50-mile transmission line is required to bring power across a 5,000-ft-high pass from the power plant at Kemano.

Even though the site is relatively flat, 5,500,000 cu yd of fill has been required. This has provided extensive space at the wharf for storage purposes plus a site for building two potlines and for future construction of two more.

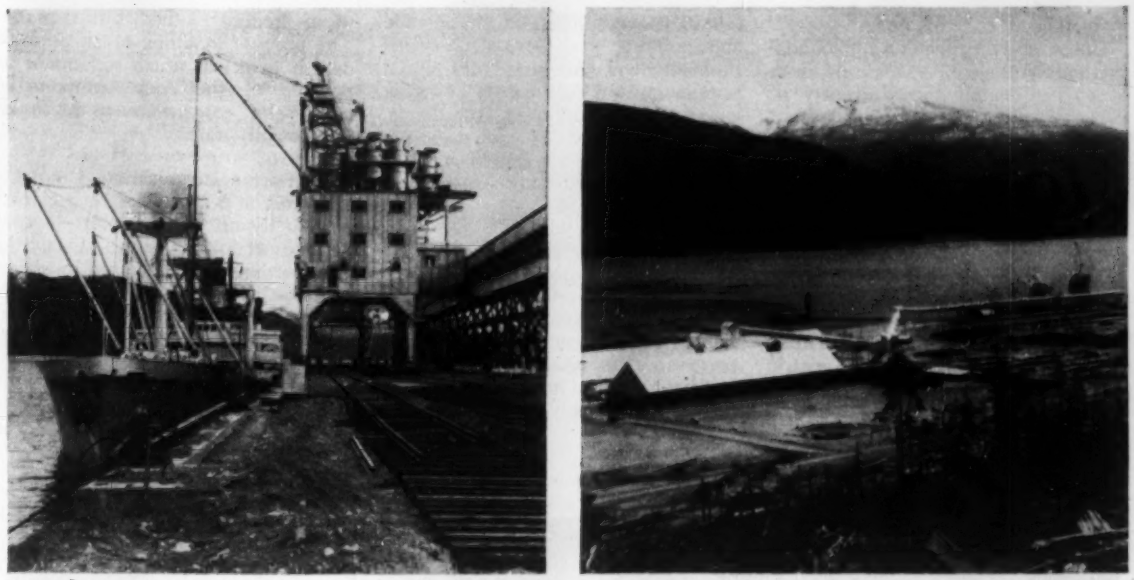
The present smelter area is 1,000x 1,700 ft and it was filled with dumped rock and gravel. The storage area and the area for additional future potlines was filled with sand dredged from Kitimat Bay. Two types of fill were used first because there are not enough dredging rigs in British Columbia to make it all of sand, and second because the dumped fill could be completed in relatively small sections and made available for building construction at an early date. Also with respect to hydraulic fill, bleeding-off of the fines in the dredged material would have been slow on such a low-lying area.

Quantities totalled 3,000,000 cu yd of hydraulic fill and 2,500,000 cu yd of dumped fill. Depths varied from 15 to 30 ft.

Dumped fill involved a 4-mile truck haul from a deposit that was extremely

Previous Alcan articles in ENR

World's biggest aluminum plant—ENR Nov. 29, 1951, p. 40.
Setting up shop in the wilderness for huge aluminum hydro project—ENR Sept. 25, 1952, p. 32.
World's largest underground power plant —ENR Nov. 13, 1952, p. 31.
Aerial tramway serves Kemano tunnels—ENR Nov. 30, 1952, p. 42.
Renaissance in rockfill dams—ENR Jan. 22, 1953, p. 35.
Wharf built in dry, floated to place—ENR Jan. 14, 1954, p. 29.
Tunnel lining at an angle—ENR Apr. 15, 1954, p. 30.



FIRST ALUMINA SHIPMENT arriving at Kitimat in June was significant milestone. Powderlike material is unloaded by million dollar vacuum gantry and transferred to belt conveyor which carries it to warehouses shown at right.

easy to develop. After stripping, it required only that a bulldozer feed a belt conveyor leading to a truck loading hopper.

This same deposit—known as the "sandhill"—also provided ample raw material for concrete and paving work. Gravel screening and concrete batching facilities were established as was a paving plant. The aggregate supply is so advantageous that concrete block can be produced at Kitimat cheaper than in Vancouver even in spite of the added cost of cement due to the long haul from Vancouver.

• **Settlement**—As noted above, settlement has proved to be more of a problem than originally anticipated. The sinking was not due to consolidation of fill material but rather to compression of silt and clay layers more than 200 ft below the original ground surface. Alcan's consultants believe that some compression is taking place in strata far below the depth of the original deep borings.

The problem with the settlement is non-uniformity; it results from varying thicknesses of the compressible layers. Total sinking over a period of two years has ranged from slightly

(*Continued on page 34*)

What is an aluminum smelter?

Nearly half a million square feet of mill buildings have been erected for the Kitimat smelter. Most space is occupied by the electrolytic cells or "pots" that are the heart of the aluminum-making process.

One building housing a group of pots is called a "potroom". At Kitimat, three potrooms having a total of 171 pots make up a "potline". A potline is an integrated group of pots using a single electrical circuit with one set of transformers and current regulating devices. For maintenance, each individual pot can be shorted out —current can be jumped across it.

Each Kitimat potroom is a mill building 1,033 ft long by 60 ft wide—and there are six such buildings. The building shell has a structural steel frame with a peaked roof. Spandrels and lintels are precast concrete. Exterior is aluminum sheeting. The relatively mild Kitimat climate and the heat of the process eliminate the need for insulation.

The pots are founded on concrete footings and the working floor is underlain with a venting system using ducts of precast concrete. Due to the high electrical charge which might result in electrolysis of reinforcing steel, no steel is used in the supporting concrete. Column footings include dowels extending through the footings deep into the fill to lead off stray currents and protect the steel structure.

The pots are lined with carbon block that is the cathode for the electrolytic process. Heavy steel electrodes lead the current into the pot carbon anode. The carbon anodes are made in a "paste" plant and carefully set in the pot. Then they are baked for a period of 2 or 3 days using coke briquettes for the fire.

In smelting aluminum, a cryolite mixture is first introduced into the pot. The power is put on and the cryolite melted. Then alumina is introduced. The alumina dissolves in cryolite permitting the electrolytic current to work on it. The oxygen from the alumina combines with the carbon of the anode and the escapes to the atmosphere. Pure aluminum goes to the bottom of the pot from whence it is removed for casting into ingots.

In this process one ton of aluminum results from two tons of alumina. The raw material is refined from bauxite at Jamaica in the West Indies and hauled by ship to Kitimat.

It takes something less than 10 kwhr of electrical energy to produce one pound of aluminum. The first two Kitimat potlines will be capable of producing 91,500 short tons of aluminum per year. That means that some 1,800 million kwhr of energy will be required each year.

Power is transmitted to the smelter at 275,000 v. It is stepped-down at substations just outside each potline to 13,000 v for use in the smelter.

Besides the potroom buildings, a group of service buildings has been constructed. Each service building group will serve 4 potlines. These include cafeteria and administrative office together with a paste plant for making electrodes. Also involved are machine shops, electric maintenance shops and the like.

more than 1 ft to in excess of 3 ft.

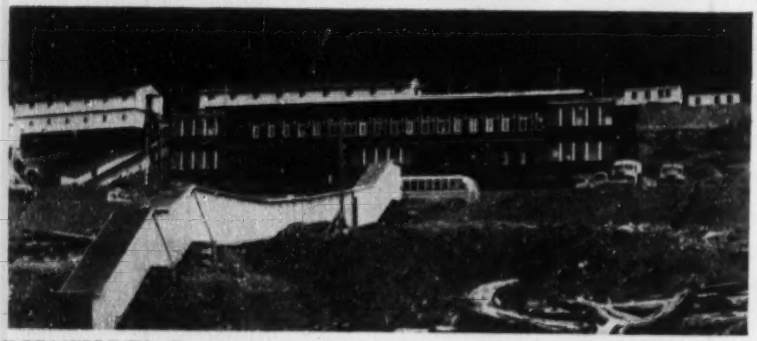
Consulting for Alcan on the foundation problems were R. M. Hardy, dean of engineering at the University of Alberta, and C. F. Ripley, Ripley and Associates, Vancouver. As a check, their analysis was reviewed and endorsed by Karl Terzaghi of Harvard University.

Because the buildings had to be erected before all settlement had developed, steps were taken to minimize the effect of differential settlement. First step for an individual building was to place the fill with a substantial surcharge on it and including a strip at least 250 ft wide around the building site. After the fill had set for a month it was levelled to finish grade and building work started. At this time extent of anticipated differential settlement was estimated. Footing elevations were adjusted accordingly. In addition, provision was made for jacking up columns should unequal settlement exceed substantially the anticipated amount.

The paste building, a four-story structure, was actually built out of plumb. It is expected that in two years it will be vertical.

Fill for a similar area for two additional potlines was started in 1953—two years after other fill work began—and has just been completed. As it is further inland, only some 600,000 cu yd of dredged material was required. The purpose of filling at an advance date is to get as much settlement as possible of the deep compressible layers before construction of the buildings actually starts.

Construction workers lived in . . .



DORMITORIES—Two story structures flanking cafeteria and general store house 53 men each and cost $80,000 each.

TRAILERS—Workers who wanted their families with them lived in trailers, some provided at cost by the contractor, others were shipped to Kitimat by their owners.

RIVER BOAT—Quick housing was provided early in the job by beaching an old river boat whose staterooms were considered choice accommodations.

• **Contractor organization**—Construction work at Kitimat has been carried out by Kitimat Constructors—a joint venture of eight British Columbia construction firms organized in an uncommon way. Usually joint ventures are headed by a sponsoring firm that takes responsibility for administration of the work. The other firms then supply funds together with such equipment and personnel as needed.

However, in the case of Kitimat Constructors there is no sponsoring firm. Instead the eight companies each have representation on a board of directors in proportion to their financial interest. Management of the combination is in the hands of top construction people called in from the outside and having no previous connection with any of the eight firms.

The combination is the brain child of J. R. Carswell who serves as chairman of the board, but does not represent any one company. Carswell headquarters at Vancouver and, in general, supervises the logistics of the work from that end. Top personnel at Kitimat are also outsiders. Project manager at Kitimat for the first part of the job was H. M. Whiting, a heavy construction specialist. His general superintendent was J. B. Whitton, an experienced building construction administrator from eastern Canada. When the job phased over from basically heavy construction to largely building construction, Whitton replaced Whiting as project manager.

Individual member companies of the joint venture have taken on parts of the work as subcontractors. For example, B. C. Bridge & Dredging Co., Ltd., has handled all the dredging work. General Construction Co., Ltd., is doing the paving work. Alcan, however, deals direct with Kitimat Constructors, which is responsible for all of its subcontractors.

The eight firms read like a blue book of the British Columbia construction industry. With the exception of Emil Anderson Construction Co., Ltd., of Hope, B. C., all headquarters in Vancouver. And there is a good distribution between heavy construction firms and building firms. In addition to the three companies already mentioned the group includes: Dawson-Wade & Co., Ltd.; Marwell Construction Co., Ltd.; Campbell-Bennett, Ltd.; Bennett & White Construction Co.; and Dawson & Hall, Ltd.

It is almost impossible to evaluate

People who built Kitimat

Many individuals have been involved with the conception and execution of the Kitimat work. Original idea for the huge hydro development germinated from the British Columbia Provincial Government. Kenney Dam is named after Hon. E. T. Kenney, Minister of Lands and Forests, under whose direction the basic surveys were made. Once the province interested Alcan in the work, the project was developed with great zest and force. Even so, Alcan had almost dropped the project because of the soft world market in aluminum when the Korean War started. Then Alcan thought it would have to drop it because of shortage of men and materials.

All of Alcan's top echelon personnel have been vitally concerned with execution of the project. The work has been a pet of R. E. Powell, Alcan president. Powel has delegated specific responsibility to McNeeley DuBose, Alcan vice-president. A right-hand man for DuBose has been J. S. Kendrick who for many years worked for the province on the original surveys. (Another former provincial official, now Alcan's property department head at Kitimat, is George Melrose who previously served as Deputy Minister, B. C. Department of Lands and Forests.)

ALCAN'S RESIDENT ENGINEER, George Malby, was in day-by-day charge of the Kitimat job, working with the contractor, Kitimat Constructors.

BOSS OF KITIMAT is A. C. "Dutch" Turney, Alcan's works manager. Turney arrived at Kitimat almost a year before aluminum production started.

Design of the Kitimat works has been accomplished by Alcan's engineering department in Montreal under the direction of W. L. Pugh, chief engineer.

Heading up Alcan's British Columbia staff has been P. E. Radley, project manager. His principal assistant is Franklin T. Matthias. As a colonel in the U. S. Corps of Engineers during World War II, Matthias was in charge of building what is now the Hanford, Wash., Works of the Atomic Energy Commission. Also on the Vancouver staff is H. C. Jenkinson who serves as chief resident engineer. Both Radley and Jenkinson have had long service with Alcan.

The men on the job at Kitimat have been and still are faced with day-by-day tasks in making the project a reality. Resident engineer at Kitimat for Alcan is George Malby. He is a long-time employee of Alcan—17 years. A civil engineer graduate of the University of Manitoba, his Alcan career has largely been spent in construction work. His most recent job was supervising a hydro plant on the Peribonka River in Quebec 60 miles north of Arvida, site of Alcan's largest smelter.

The man who will actually run the Kitimat works for Alcan is A. C. "Dutch" Turney, plant manager. He comes to Kitimat from the Arvida works where he was assistant works manager. He has been with Alcan for 13 years coming into the managerial end of the business from a position as metallurgist.

Head man at the windup for the Kitimat Constructors was J. B. Whitton. From eastern Canada, Whitton has had a longe career supervising building construction. During the war he was in shipyard work and most recently he supervised the building of radar installations on the Labrador coast. Whitton comes from an unusually talented family. His sister, Charlotte Whitton, is mayor of Ottawa.

CONSTRUCTION HEAD, J. B. Whitton (left), project manager for Kitimat Constructors, pauses during his daily inspection of the work to chat with Sid Stewart, acting business agent for the ironworker's union.

at this time the success of this type of joint venture as compared with the "lead contractor" type.

Theoretically, a sponsor firm would be more deeply obligated to develop top performance than would a group of outside management men. But, the organization as set up was a convenient way to keep the job in the hands of B. C. firms—considered desirable since the more expensive hydro facilities are designed and constructed by Canadian subsidiaries of U. S. firms.

It can be said for the Kitimat work that the smelter construction has kept pace with development of the hydro facilities; excavation of the 10-mile long power tunnel, and manufacture and installation of turbines and generators, have been limiting factors on early aluminum production. Thus, from the important standpoint of schedule, the Kitimat Constructors joint venture has been successful.

• **Contract details**—Most of Kitimat Constructors work has been on a target-estimate or a cost-plus-fee-plus-incentive basis.

Basically this means that an estimate of the work is agreed upon between Alcan and K. C., with the contractor getting a bonus should the actual cost be less than the estimate and a penalty if it is more. Bonus and penalty are percentages of the savings or extra cost, with the bonus percentage generally being considerably higher than the penalty percentage. Included are escalation clauses to account for wage and materials price increases.

This is the same general arrangement under which the hydroelectric

(*Continued on page 36*)

facilities of the project were constructed by Morrison-Knudsen Company of Canada, Ltd. The basic difference is that, in the case of Kitimat Constructors, the work was developed in increments, with each part having a separate estimate instead of one overall target estimate. However, the targets are accumulative so that bonus or penalty cannot be assessed until the work is completed and a final account made.

Reason for the number of targets is that designs were developed in stages. And estimates were not agreed on until designs were fairly firm. For example, the wharf structure was one increment, the smelter plant buildings another.

Not all Kitimat Constructors work was on a target-estimate basis: Some portions of the project could not be readily estimated. These jobs were done on a fixed-fee basis with no bonus or penalty. However, the fee was adjusted if the scope changed. Clearing operations is a good example of fixed fee work. Actual cost has averaged somewhere around $2,500 an acre, with some sections going as high as $4,000 an acre.

Finally, some of the work was on a straight unit-price basis. Paving work is an example. It came toward the end of the job when costs of operating were fairly well determined.

• **Men and materials**—Kitimat Constructors had much the same logistics problems in connection with building the smelter that Morrison-Knudsen did in building the hydro facilities.

Operating at the end of a 400-mile supply line was not easy. There was high personnel turnover due largely to rules of British Columbia construction trades unions. While these rules vary for different trades, most of the workers were permitted transportation to and from Vancouver for only a 60-day work period. Result was that there were a lot of 60-day "wonders."

K. C. did all possible to make the job attractive for workmen. Recreation facilities were set up. Good cafeteria-style messing was provided, and adequate living quarters were built.

Early in the work the "Delta King," an ex-Sacramento River steamer, was beached to provide dormitory space. The "Delta King" boilers also later served to heat the schoolhouse a few hundred yards away.

A total of nine two-story bunkhouses was built, each housing 53 men with no more than two men to a room. The bunkhouses are steam heated, cost $80,000 each, and have complete sprinkler fire protection systems.

And 100 temporary family dwellings housed the more important supervisory personnel for Alcan and K.C. A trailer camp permitted other workers to bring their families to Kitimat. In spite of all these facilities, much dependence had to be placed on tent camps particularly at locations away from the main area.

The bunkhouses and temporary family dwellings have been taken over by Alcan and will be used for operating personnel. Although labelled temporary, they will undoubtedly be used for several years to come. Construction is substantial enough to permit this.

Another important phase of taking care of the workmen was an extensive safety program. This paid off handsomely. Even though there were more than 2,000 workers on the job almost continuously for well over two years, there were no fatal construction accidents.

• **Construction to production**—Transition of the Kitimat works from a construction job to an operating facility has been spread out over a long period of time. Kitimat Constructors installed most of the major equipment, but some of it has been placed by Alcan operating people.

The plant management team started to arrive at Kitimat a year ago. Initially, they were attached to the Alcan resident engineer forces. For example, the plant electrical superintendent was in charge of inspection of the electrical construction. Actual plant operations started late in 1953 with first use of the carbon paste plant. Tempo of plant operations gradually increased so that by July the smelter was ready for aluminum production.

To facilitate windup of the job, the Kitimat Constructors contract was officially terminated on June 30, 1954. Although K.C. is still on the job, work being done is in the nature of clean-up with only a little construction involved. It is being accomplished on a straight cost-plus-fee basis rather than cost-plus-fee-plus-incentive.

In the process of such termination, Alcan took over at various dates such services as the hospital, the recreation hall, the cafeteria, the bus line, the equipment garage and the concrete plant. Many of these have been turned over to operating contractors. For example, Kitimat Concrete Products Co.—a private concrete block and pipe producing organization—is operating the concrete plant. A catering firm is running the cafeteria.

Only part of the 1,000 Alcan employees needed to operate the initial elements of the smelter are now at Kitimat. It may not be until well into next year that the full working force is on the job. Limiting factor is permanent accommodations: Only part of the temporary facilities that house up to 3,000 construction employees are considered suitable even for temporary use by operating people expected to remain permanently.

Most of the operating force is being hired and trained in British Columbia. Only about 35 people have been or will be transferred from Alcan plants in eastern Canada.

• **What of the future?**—Even with the smelter in operation, the Kitimat plant is far from completed. One potline is producing, and the second will be in full production certainly by early fall. But ultimate plans call for 12 potlines. And even the uninitiated can see that more than one-sixth of the development is needed to produce a return on the money invested.

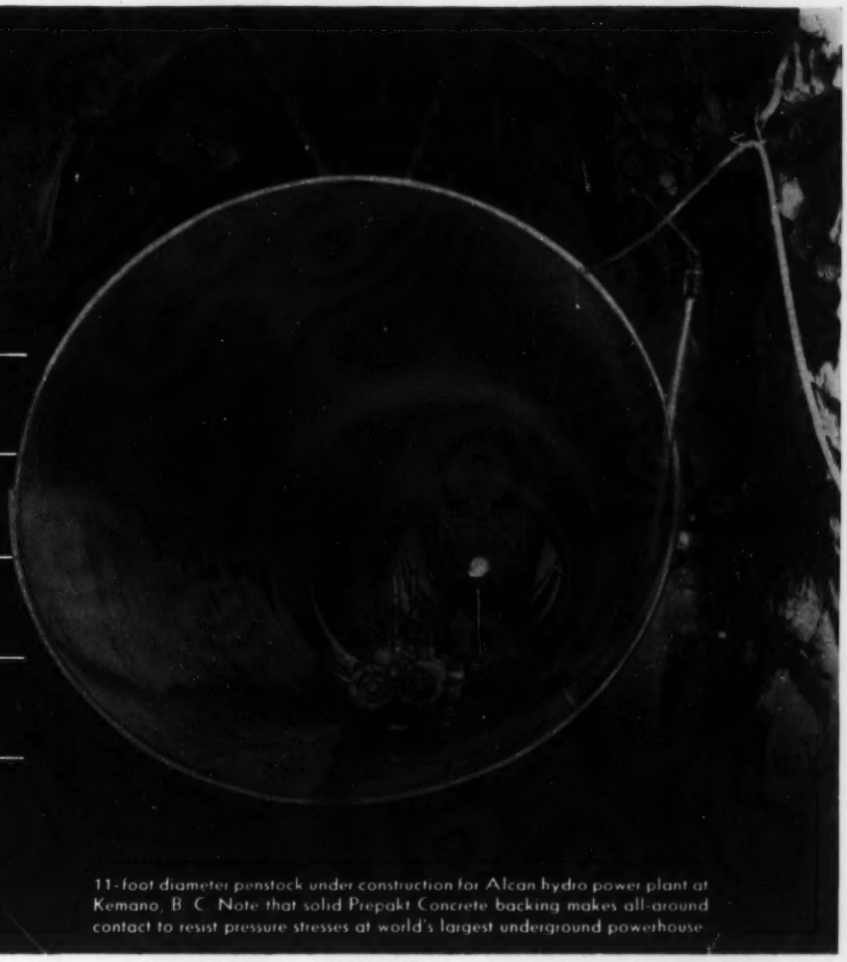
In essence, Alcan has an investment in the future world market for aluminum. The Kitimat plant can be expanded quickly and for a moderate additional sum. Two potlines can be added in less than two years from the day the go-ahead signal is given. The smelter site is prepared. One additional generator at the Kemano power plant would carry the load: two would be really needed to provide spare capacity. Adding two units at Kemano would require only lining the second penstock tunnel; it is already excavated.

Many observers believe that potlines 3 and 4 will be producing late in 1956. They almost certainly will be on the line by the end of 1957.

One controliing factor is the U. S. market. Agreements made in 1953 with U. S. fabricators would deliver almost 900,000 ton of metal over a six-year period (600,000 tons to Aluminum Company of America, 186,000 tons to Kaiser Aluminum & Chemical Corp. and 110,000 to "independent" fabricators). But the U. S. Justice Department contested the Alcoa agreement. A recent decision upheld the contract, but put the independents first in line should a shortage develop. This could well result in a very early announcement of construction of potlines 3 and 4.

Pot lines 5 and 6 would be almost as easy to add. Three more generators plus smelter facilities would do the trick. For the remaining 6 potlines, a second 10-mile long power tunnel would be needed, together with new penstock tunnels and more underground powerhouse excavation. This may not come into being for another 10 years. But the potential is readily available to make Kitimat the biggest aluminum smelter in the world, and make the Kemano powerhouse rank with Grand Coulee as greatest in capacity.

Kemano penstock encased with all-around economy



11-foot diameter penstock under construction for Alcan hydro power plant at Kemano, B. C. Note that solid Prepakt Concrete backing makes all-around contact to resist pressure stresses at world's largest underground powerhouse

▶ At Kemano, B. C., the Aluminum Co. of Canada, Ltd., has built the world's largest underground power plant to supply its new aluminum smelting facilities at Kitimat, B. C. Penstock encasement work for this project was done by Prepakt with outstanding economy and results.

Use of Prepakt Concrete to embed 3,900 feet of 11-foot diameter steel penstock lining eliminated the expense of later contact grouting. Exhibiting no setting shrinkage, Prepakt Concrete assures complete concrete backing with full 360° contact—*without after grouting!* At Kemano, this Prepakt advantage bonds the steel, concrete and natural rock into an integral high-strength mass which resists the high pressures developed by the 2,600-foot head of water.

Prepakt Concrete was made in place by pumping Intrusion Mortar into coarse aggregate preplaced in the annular space between the steel penstock lining and the excavated rock outline. Encasing Kemano's ¾-mile No. 1 penstock required 19,000 cu. yds. for two 48°- sloping sections, 8,000 cu. yds. for two horizontal runs.

The lower 2,000-foot sloping section was encased in one continuous lift! Simultaneous aggregate placement and pumping of mortar was used in around-the-clock work to encase the tunnel in 21 working days. Upper 1,200-foot sloping section was done in two lifts of 400 and 800 feet.

This is another example of the economy obtainable with Prepakt methods and materials.

Have you considered Prepakt methods and materials for your problem? For further information on other applications, write on your letterhead to: The Prepakt Concrete Co., Room 779-R, Union Commerce Bldg., Cleveland.

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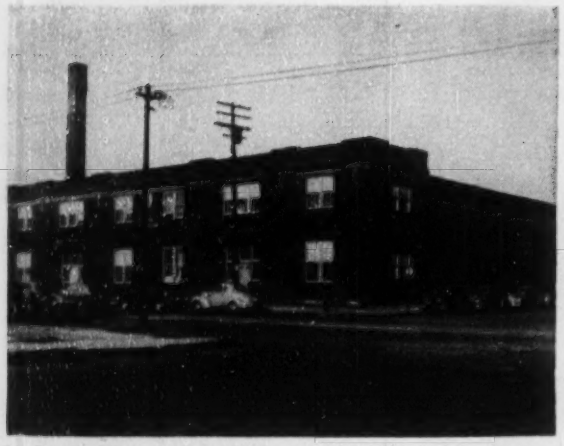
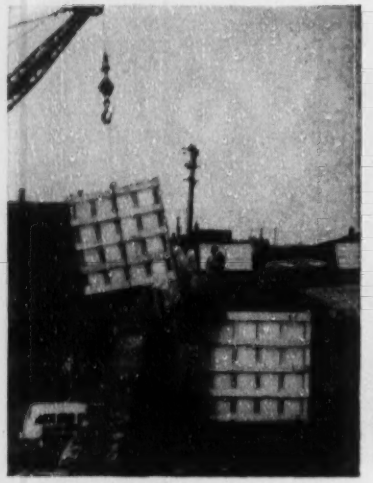
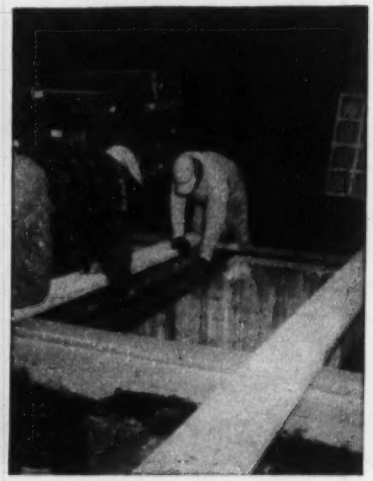


Before Meter service building with blank rear wall took little advantage of natural lighting.

After Glass block with clear-vision strips replaced old windows and were built into rear wall to admit more daylight.





SKYLIGHTS with flat glass were replaced with glass block, which was delivered in 4x4-ft panels, ready to be set in place. T-bars provide edge support (right).

BUILDING INTERIOR receives high-intensity daylight from glass-block skylights and windows, with little glare.

Better daylighting in repaired building

Reconstruction of a 38-year-old building that had been damaged by a tornado last year has yielded Cleveland, Ohio, a much sturdier and better illuminated structure. Glass block in walls and skylights permit high intensity natural lighting with little glare.

The R. Hansen Co., of Cleveland, was awarded a contract to rehabilitate the building, which is used by the Light and Power Division of the city's Department of Public Utilities for testing, repairing and storing electric meters. First step in reconstruction was replacement of skylights and rebuilding a 22x65-ft section of roof.

New steel beams placed 8 ft c-c give added strength to the structure and support a new precast-concrete roof deck. Because of maintenance problems encountered with the original flat-glass skylights, they were replaced with 4x4-ft panels of glass block supplied by Owens-Illinois. Each panel consists of 16 block set in an aluminum grid. Prisms in the block reject much of the light and heat from the summer sun, but transmit a high percentage of light from the low winter sun and "cool" light from the north sky, yielding uniform, comfortable daylight transmission throughout the year.

In addition to the roof repair, glass windows were replaced with light-directing glass block in combination with clear-vision strips.

According to N. S. Myers, chief of the meter bureau, the reconstruction work has provided the city with a building comparable in most respects to a new structure at a fraction of the cost of a new building.

Contractor Saves 30¢ a Yard on 17-story Hospital Job

. . . It was done with Pumpcrete®

Using Rex Pumpcrete, *the pump that delivers concrete by pipeline,* the contractors for the $11 million Mayo Medical Center, on the University of Minnesota campus in Minneapolis, saved 30¢ per cubic yard in placing concrete.

Two Rex Pumpcretes, with a concrete crew of eight, placed a floor a week—working right through the winter without losing a day. The Pumpcretes delivered *all* of the concrete for floors and columns for this seventeen story structure.

At the completion of the job, the twin six-inch pipe ran a total of 550 feet from the ground level mixing plant and had pumped concrete up 176 feet above the ground. Shortly after completing this job, both Pumpcretes were at new building sites, again keeping concrete placement costs low.

Over-all view of hospital with lower floors completed and concrete being placed on upper stories. Flexibility of this setup permitted spanning 250 feet between wings of building, easily . . . at low cost, saving erection of still another tower, as would have been the case using buggy method of concrete placement.

When you Pump Concrete . . . costs come down

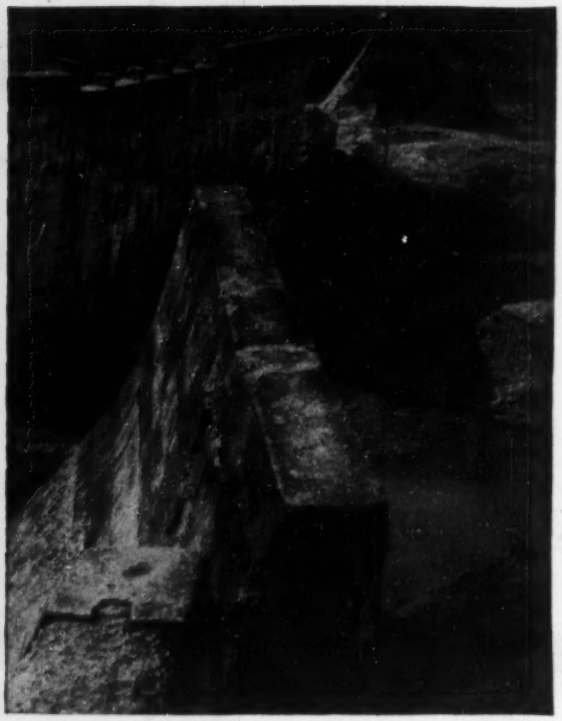
If you're interested in seeing other types of jobs on which Rex Pumpcrete has cut the cost of concrete placement, we will be happy to send you copies of "It Was Done with Pumpcrete." There may be helpful data you can use to cut costs on your jobs. See your Rex Distributor or write Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT REX COMPANY ®

CONSTRUCTION MACHINERY

MOTO-MIXERS® MIXERS PUMPS PUMPCRETES® PAVERS

EARTHFILL BEGINS—With stream diversion almost complete, filling gets under way (center) at First Fork Dam. View from right abutment shows cutoff trench at left.



GRIM REMINDER—A few miles upstream from First Fork Dam stands the remains of Austin Dam, which failed in 1911. Dam-building advances forestall such a fate for First Fork.

Flood control dam is state-financed

Deciding federal aid would be too slow, Pennsylvania is undertaking a $12-million project on its own

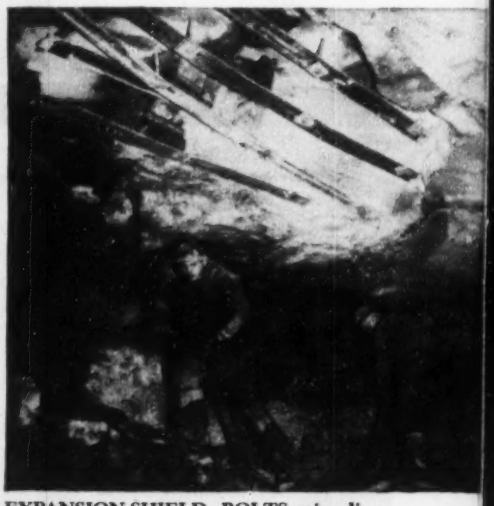
A. E. Niederhoff
Resident Engineer
Gannett, Fleming, Corddry & Carpenter, Inc.
Harrisburg, Pa.

Pennsylvania, which took the lead in turnpike construction, has also done some pioneering work in financing and building flood-control dams without monetary aid from the federal government. Its latest dam of this character is now under construction on the First Fork of Sinnemahoning Creek, a tributary of the Susquehanna River, with tunnel diversion works nearing completion, and earthfill operations entering the two-shift stage. Completion is expected by December, 1955.

Prior to undertaking First Fork Dam, the Commonwealth of Pennsylvania had constructed, in 1950, a flood-control dam across Little Pine Creek at a cost of about $3 million, and earlier had completed several smaller dams, primarily for recreational purposes but also functioning as flood-control structures. First Fork Dam and reservoir costs will total about $12 million making this by far the largest of the state-financed flood control projects.

Financing of First Fork Dam is handled by the General State Authority (ENR March 16, 1950, p 36). This authority is empowered by legislative action to sell bonds for construction purposes, and to pay interest and amortize them by renting the completed facility to the requesting state agency. Requesting agency for First Fork Dam is the Department of Forests and Waters. The Department of Forests and Waters places an item in its annual operating budget for dam rental, thereby spreading the construction cost over a period of years. Interest rate is less than 2%. In this manner the requesting agency is not dependent upon securing a huge appropriation through legislative action. Upon completion of the dam, the Department of Forests and Waters operates and maintains it.

It should be pointed out, however, that the federal government has been active in Pennsylvania flood control continuously. Notable examples of U. S. Corps of Engineers projects since World War II include local protection works at Sunbury and Williamsport, and Conemaugh Dam (ENR



EXPANSION-SHIELD BOLTS pin diversion tunnel roof rock up to firmer

CUTOFF TRENCH has a maximum depth of 60 ft, baring bedrock that is being grouted thoroughly. Concrete grout cap (invisible because of mud) seals rock against escape of grout placed at shallow depths.

Sept. 24, 1953, p 22.) About four more dams, including First Fork, have been embodied in long-range plans of the Army Engineers. In the case of First Fork Dam, the state saw fit to go ahead on its own in order to get a needed facility sooner.

•**History of floods**—State action probably was spurred by the hydrologic history of First Fork.

This stream's greatest flood in recent times occurred during a storm July 17-18, 1942. This storm has become a classic, not only for its wide coverage, but also because of the spotty character of precipitation intensity, which gave phenomenal runoff from small basins. For instance, the U. S. Geological Survey estimated the peak runoff from First Fork at 80,000 cfs while the adjacent Driftwood Branch, with a slightly larger catchment area, had a measured peak flow of only 47,800 cfs.

Other large runoffs have been observed on the First Fork in May, 1946 and March, 1936. The greatest flood of all occurred in 1889 when 9.8 in. of rain fell in nearby Wellsboro, Pa., in 36 hours.

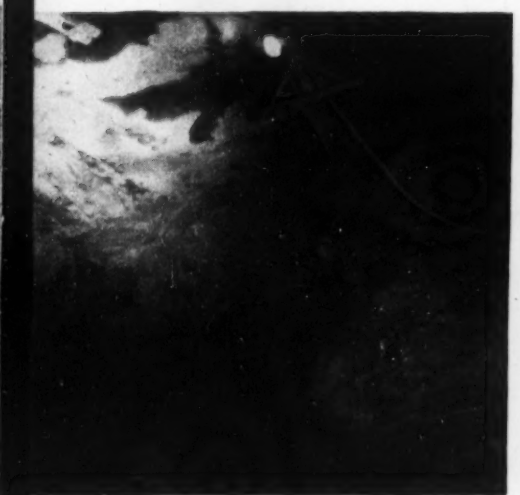
• **A failure**—The drainage area of First Fork Dam includes the site of the destroyed Austin Dam, located 20 mi upstream, which failed in 1911. Owned by a paper company, it was a concrete gravity section founded on porous sandstone interspersed with layers of clay and shale. Failure was by sliding. The disaster took 75 lives and destroyed 200 homes and stores.

• **Rugged country**—First Fork Dam is located in the northwestern part of the state, controlling a forested drainage area of 243 sq mi. The topography is rugged and there are few improvements and no towns within the reservoir area or downstream to First Fork's confluence with Sinnemahoning Creek.

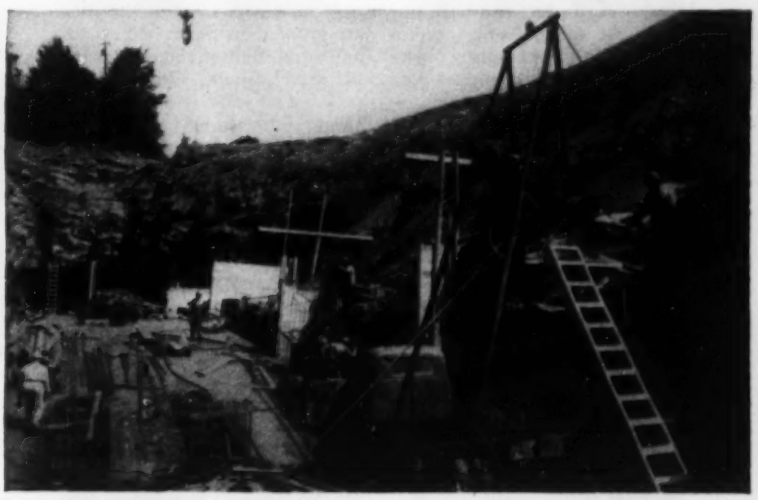
The reservoir at maximum pool El. 1026 above msl has an area of 1,470 acres and a storage capacity of 76,400 acre ft. This is equivalent to 5.9 in. of runoff from the 243 sq mi of catchment area. A permanent conservation pool for recreational purposes will be maintained at El. 920. This pool will be about 30 ft deep at the dam. A state highway that parallels First Fork has been relocated around the dam and reservoir.

The dam is designed as a rolled earthfill structure with a rock toe and rock shells on both up and downstream slopes. It will have a maximum height

(*Continued on page 42*)



strata. Contractor says these bolts are easier to use than wedge-expanding type.



DRILL CARRIAGE for stilling-basin wall-anchorage work is a flexible unit. Wall anchors are grouted in rock. Outlet tunnel's lower portal visible in background.

of 170 ft, will be about 1,650 ft long, exclusive of the spillway, and will contain about 2,100,000 cu yd of material. Much embankment material comes from structural excavation, from the tunnel and from the spillway chute.

On the right bank, at a convenient dike or nose of rock, is the ogee spillway with its excavated chute extending about 500 ft downstream. Crest elevation will be at El. 1026 and the effective length 250 ft. With a surcharge of 25 ft, the capacity of the spillway will be 120,000 cfs.

The outlet works consists of a 16-ft dia concrete lined tunnel about 1,200 ft long, controlled at the upstream end by two Broome type sluice gates, each 8 ft wide and 16 ft high. Tunnel lining is practically complete and diversion of First Fork through the tunnel will take place Aug. 15. Driving the tunnel through the fractured sandstone mountain ridge took 97 days and was accomplished by Lewis and Bowman, Goldsboro, N. C. contractor, under a subcontract with Nello L. Teer, of Durham, N. C., the prime contractor. Tunnel roof supports consisted of either structural steel arch rings or roof bolts.

The roof bolts, which are about 6 ft long, pin the exposed rock layers to the more massive rock above them.

• **Roof bolts differ**—This is not the first use of roof bolts in tunnels—they supported rock for the Keyhole Dam diversion tunnel in Wyoming and in East Delaware Tunnel (ENR March 26, 1953, p. 32). But those bolts were of the simple wedge-expanding type, rather than of an expansion-shield type as used at First Fork.

Wedge-expanding bolts depend for their anchorage on driving the wedge-head against the bottom of the hole. The wedge, which is in a slot at the end of the bolt, pushes the bolt tips against the side of the hole, accomplishing a friction anchorage. The other end of the bolt is threaded, a nut being used here to apply the anchorage force to the outer rock through a large washer or a steel mine tie.

The threading on the bolt allows some tolerance in the penetration depth of the bolt, but it can be seen that the hole must be drilled to a prescribed depth with fair precision. If the hole is too deep the threads cannot be reached by the nut; if the hole is not deep enough there will not be enough thread to allow the nut to come up snug.

Most of these disadvantages were overcome by the expansion-shield type roof bolt at First Fork. J. S. Lewis, Jr., president of Lewis and Bowman, points out that although the hole may not be under-depth, it can be over-depth by any amount. The expansion shield, larger than but otherwise similar to those used for anchorage in structural concrete, can take its bite any place in a hole. All that is necessary is to rotate the bolt when it is in correct position, and the shield grabs on. Further rotation of the bolt strengthens the anchorage and advances the bolt into the hole.

This bolt differs from the expanding wedge type at the outer end also. Instead of being threaded it has an upset square head that permits application of torque and bears against mine tie for application of anchorage force.

• **Savings effected**—Aside from the advantages of one roof bolt over another, the roof-bolting method enabled major savings in tunneling time and material cost when compared with the arch-ring and lagging method of ground support. There was less interference with concrete placing in the crown and sidewalls of the tunnel lining where roof bolts were used. The arch-ring method had to be used, however, in one section of fractured rock.

• **Special drill rig**—Below the tunnel is a concrete-lined stilling basin, which will dissipate the energy of the fast-moving water, by means of a hydraulic jump. Here the contractor has exhibited another bit of ingenuity by developing a lightweight drill carriage for anchor bars that hold basin sidewalls to the surrounding rock. Mounted on a light truck as illustrated, it is a pipe frame carrying a horizontal bar mounting for a drifter. The bar, which also supports a man platform, can be unclamped from the frame's upright and hoisted or lowered for correct position of the anchor-bar holes. The drifter has a 4-ft power feed, four changes of steel being required for holes that embed No. 11 deformed bars 15 ft in the rock. Bars are grouted in place.

Overburden of the dam site consists of gravel, sand, silt and weathered rock. The rock is a laminated sandstone interbedded with shale, the cracks of which require much grouting to prevent the flow of seepage water. The material in the borrow area is largely a compact, well graded sandy silt containing flat sandstone rock fragments. There is no evidence of clay, but the material is quite fine in gradation and has a high degree of stability.

For construction of embankment, specifications call for 90% of standard A.A.S.H.O. density at 10% moisture. In-place density tests have been running around 93% of standard density after three passes of a large tractor-drawn sheepsfoot roller on 6-in. compacted layers.

• **To avoid confusion**—Where possible, project specifications are the same as those used by other construction agencies in Pennsylvania. For example, sluice gate, bridge crane, embankment and grouting specifications are those of the U. S. Corps of Engineers. Concrete aggregates are specified in accordance with Pennsylvania State Highway Department practices.

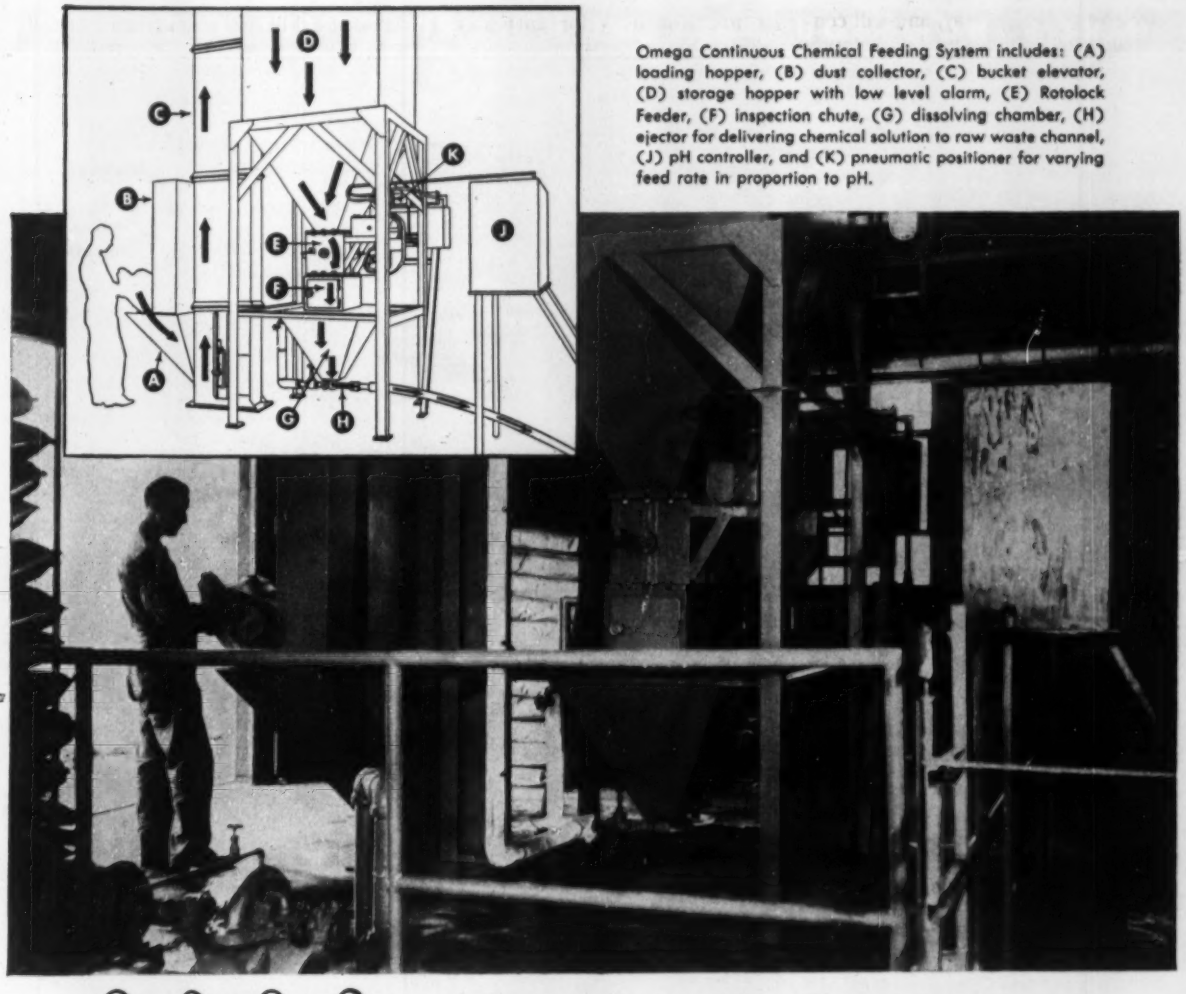
One state spec, however, has been modified for adaptability to dam construction. It covers, coarse stone for filter material in the dam. Stone available at the damsite will not pass the state highway test for concrete-aggregate soundness, but it is adequate for the filter. In this case it remained desirable to use a state-type testing procedure. The SHD test calls for five cycles of sodium sulfate treatment, to yield a loss of not more than 10%, whereas the First Fork Dam filter-stone test increases the allowable loss to 12.8%.

No problem of foundation settlement exists, and underseepage will be controlled by a deep cut-off trench backfilled with select impervious material, and by thorough grouting.

A feature of foundation grouting in the cutoff trench is the grout cap, a continuous concrete slab cast in a 3 x 3-ft groove blasted out of the exposed foundation rock. Sleeves were left in the concrete to admit diamond drills and grout pipes. Purpose of the grout cap was to provide a reaction against minimum grout pressures, applied in shallow holes. On the right abutment the grout cap is combined with a keywall, which goes 5 ft deep into rock and stands 5 ft into the earthfill.

The writer's firm was retained to design the dam in June, 1952. In August, 1953, the dam construction contract was awarded by the General State Authority to the Teer firm on its low bid of $6,670,000, which was substantially below the engineer's estimate. Ten engineers employed by Gannett, Fleming, Corddry and Carpenter now supervise the construction of this large flood control dam.

• **A UCW job**—Contractor employment has stepped up to 200, a feature of this employment being that the bargaining agent for the employees is the United Construction Workers union. Some men also carry AFL cards. The March 11, 1954 issue of ENGINEERING NEWS-RECORD (p. 28) told about a hearing at nearby Emporium, Pa., where a National Labor Relations Board examiner heard an AFL petition for a union representation election at the construction site. Upon agreement by UCW, the AFL unions and the contractors, the hearing was adjourned indefinitely, and no further moves have been reported.



Omega Continuous Chemical Feeding System includes: (A) loading hopper, (B) dust collector, (C) bucket elevator, (D) storage hopper with low level alarm, (E) Rotolock Feeder, (F) inspection chute, (G) dissolving chamber, (H) ejector for delivering chemical solution to raw waste channel, (J) pH controller, and (K) pneumatic positioner for varying feed rate in proportion to pH.

CONTINUOUS WASTE NEUTRALIZING THE EASY, OMEGA WAY

WOLVERINE TUBE Division of Calumet & Hecla, Inc., at Decatur, Ala., uses this Omega Continuous Chemical Feeding System to neutralize acid pickle liquor wastes. As shown in the drawing, the system is a "load it, forget it" combination of standard Omega units engineered for continuous, automatic operation. Soda ash is fed by an Omega Rotolock Feeder in response to a pH Controller — at rates varying over a 15 to 1500 lbs. per hr. range. The Rotolock Feeder's high volumetric accuracy (within ± 1%) and wide range insure proper waste neutralization under all flow conditions.

This system was engineered in cooperation with Howard, Hickerson and Jordon, Engineers-Architects, of Nashville, Tenn. Omega welcomes the opportunity of working with you and your engineers in the application of Omega Feeders to your chemical feeding problems. Write for Bulletin 45-H8 and complete details. Omega Machine Company, 390 Harris Ave., Providence 1, Rhode Island.

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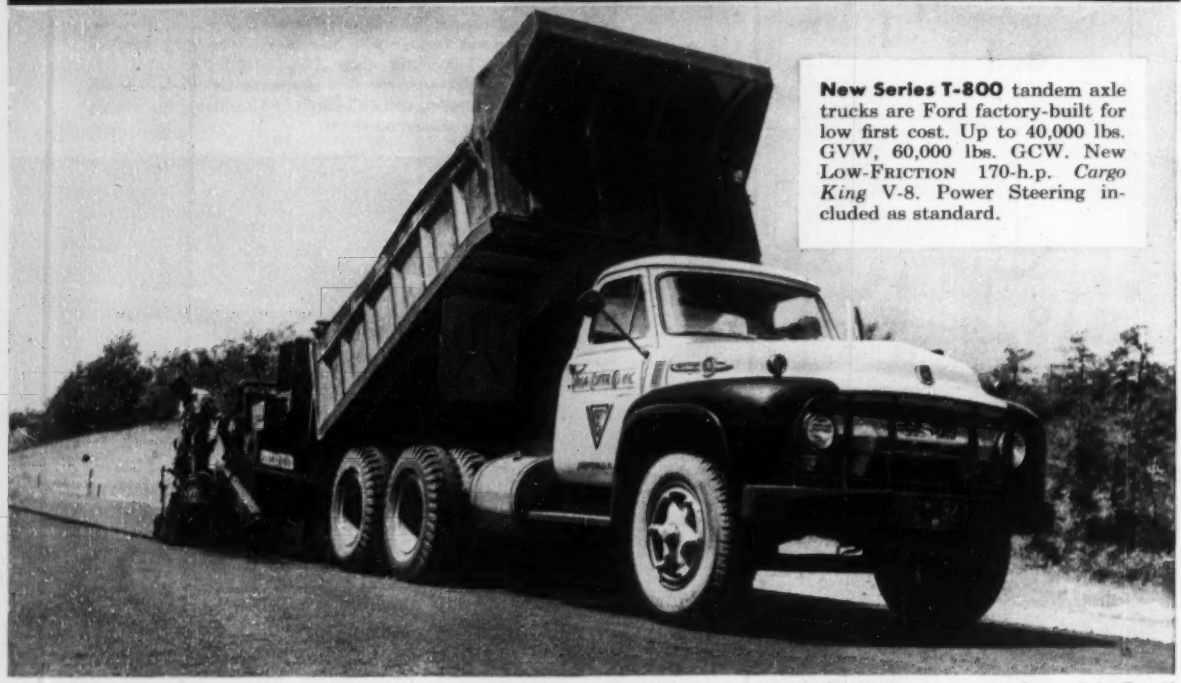

New Series T-800 tandem axle trucks are Ford factory-built for low first cost. Up to 40,000 lbs. GVW, 60,000 lbs. GCW. New LOW-FRICTION 170-h.p. *Cargo King* V-8. Power Steering included as standard.

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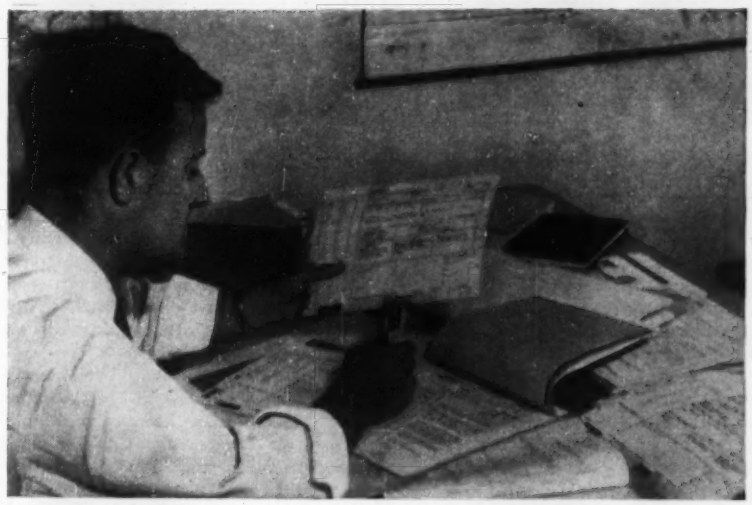
(Or write Ford Division, Ford Motor Co., Dept. T-11, Box 658, Dearborn, Mich.)

FEATURE	FORD T-800 TANDEM	TRUCK A TANDEM	TRUCK B TANDEM	HOW YOU BENEFIT
Engine				
Horsepower per cu. in.	0.536	0.379	0.415	**Greater concentration of power!** Ford offers more horsepower per cubic inch of displacement. Smaller displacement usually means less gas.
Piston Stroke (in.)	3.50	4.50	5.00	
Piston Speed ft. per min. (at 3000 rpm)	1750	2250	2500	**The slower piston speeds** of Ford's Short Stroke design cut piston travel, reduce wear, increase engine life.
Free-turn Intake and Exhaust Valves with Integral Guides	Yes	No	No	**Free-turn valves with integral valve guides** let valves run cooler, last up to 50% longer!
Cab & Controls				
Power Steering Standard	Yes	No	No	**Only Ford** offers Power Steering as standard equipment. Cuts steering effort as much as 75%.
Glass Area (sq. in.)— Windshield	938	841	735	**Ford's "visibility unlimited"** means greater truck-driving safety, ease and comfort for the driver.
Total Std. Cab	2103	1705	1709	
Seat Shock Snubbers	Yes	No	No	**Only Ford** has these two driver-saving features—seat shock snubbers and woven plastic upholstery—that are tops for a smoother, cooler, more comfortable ride.
Woven Plastic Upholstery	Yes	No	No	
Chassis				
GVW Rating (lbs.)	40,000	38,000	39,000	**Money-saving,** trip-saving capacities are an important feature of all Ford **Triple Economy** Trucks.
Payload-Body Capacity (lbs.)	29,943	26,067	26,735	**Ford's front axle** capacity exceeds all other makes by as much as 2000 lbs. for greater dependability, safety.
Front Axle Capacity (lbs.)	9,000	7,000	8,000	
Total Rear Spring Capacity (lbs.)	31,100	30,940	26,000	**Greater spring capacity** is another example of Ford's sturdier construction for bigger payloads, longer life.

All chart information is based on latest data available as of 6-30-54 and is believed to be reliable but is not guaranteed.



PUNCHING RECORD CARD for California's water pollution inventory is Thomas R. Trainer, who is assisting in installing the system. Considerable detail is recorded on the 8x10 card.

SORTING IS EASY—Needle is inserted through one set of holes, and cards that have been punched at that point fall out. For two or three digit or letter punchings, two or three needles are used.

Putting pollution on file

It is no simple matter to compile a detailed list of waste discharges in a state as big and as populous as California—especially if the list is to be kept up to date.

That's what officials of the State Water Pollution Control Board and the nine regional boards discovered as they put in operation an edge-punch card system of record keeping. It results from thorough study of the need, and will take more than two years to complete. But, after elements of the listing are finished, it appears that they can be maintained easily.

Need for such a list became evident shortly after California's new pollution control system went into operation four years ago (ENR June 14, 1951, p. 120).

The state is divided into nine areas, each administered by a nearly-autonomous regional control board. Each board has authority to stipulate requirements for waste discharges that result in pollution—defined as "impairment of quality to a degree that adversely affects beneficial water uses." The requirements can cover desired end result only and cannot specify the manner in which results are to be obtained.

The state board coordinates work of the regional boards so far as such matters as research and budgets are concerned; it can also step in if a regional board has failed to act.

Regional boards coordinate with all state and local agencies in their area having to do with waste discharge. For example, the state health department still has authority over contamination—discharges that result in an actual hazard to health.

• **How to compile?**—When the new setup went into operation, the newly-created boards found that the only available record of waste disposal was a partial listing of domestic sewage treatment plants then in operation. Many more data were needed to prepare necessary operational and statistical reports, to furnish information to other agencies and to aid in organizing the work of the boards. How to compile this additional information?

The answer was facilitated by a federal grant of $27,100 under Public Law 845 for the conduct of investigations, research, surveys and studies relating to the prevention and control of water pollution caused by industrial wastes. The executive officers of the regional boards recommended that in expending these funds priority be given to design and establishment within each region of a standard system of permanent records for discharge of waste.

First step in implementing this recommendation was design of a system that could be used. Brown & Caldwell, civil and chemical engineers of San Francisco, were retained by the state board to design and test a record system.

The study recommended the edge-punch card system now being put into effect. When the study had been approved, steps were taken to implement its recommendations.

• **Installing the system**—Thomas R. Trainer, a sanitary engineer on the staff of one of the boards, was selected to assist in putting the system in operation. He is now spending time with each regional board, going through all of their data to set up their card system. When he completes his work with a regional board, a working inventory is available that can be maintained by the board staff. So far, after six months' work, Trainer has completed his work in the San Francisco Bay region and the Santa Ana region. He has seven more regions to cover; it may take two years.

• **Requires digging**—Here's how Trainer goes about his task:

First, he goes through the board's

(*Continued on page 46*)

records and prepares a card on each waste discharge on file. Actually, he records data on a work sheet and makes the necessary punches on the record card. The data are later typed on the record card by a stenographer.

Note that the record card in no way supplants the detailed files on individual waste discharges. It serves as a way of finding in short order all discharges of a certain type, all discharges in a certain area.

All waste discharges have not yet been the subject of consideration by a regional board. So Trainer next pores over all types of reports that a board may have available.

Each waste discharge cited is recorded. Perhaps not all information provided for on the cards is available, but the records are not intended to be 100% complete. It would be foolish, for example, to record a complete chemical analyses on all discharges; only where there is some particular chemical problem would it be necessary.

It may be that not enough data are available for the record card or that discharges are known of without any information being readily available. In that case, the municipality or industry involved is contacted either by phone or in person, usually by the regional board's executive officer. The record purposely avoids any entry that calls for information considered by the industry to be of a confidential nature.

When all these sources are fully exploited, the records are fairly complete. Maintenance of the system by the regional staff is then routine.

• **All in the cards**—Included on the 8x10 cards are these data (with edge punching making sorting easy):

Discharger, county, type of activity (industry, public, etc.), drainage basin and subbasin, groundwater basin and subbasin, relative size of city, type of industry (using the federal classification system), type of waste, treatment type, beneficial uses of receiving water and discharge characteristics. (Extra holes are available on the cards should additional edge-punching be desired.) The cards have all these data typed on them in more detail. And the back of each provides space for a chronological record of dealings between the board and the discharger.

Cards are sorted easily by inserting a needle in the hole corresponding to the information required. On lifting the cards, all that have been punched —indicating discharges of the type wanted—fall out. Such sorting is usually done in groups of 100 cards.

Advantage of the edge-punch system is that sorting is simple; expensive equipment is not required. In no region will the number of discharges be more than 2,000; most will have only a few hundred.

The three deep holes can be punched for classification numbers of three digits. Or they can be punched for the first three letters of the name of the discharger.

According to a survey made by Brown & Caldwell in designing the system, the California inventory will be as extensive as is maintained by any state. Massachusetts has a punch card system. But the small size of the cards for mechanical sorting limits the data that can be recorded on them. Maryland and the U. S. Public Health Service have edge-punched systems that are less extensive.

Work of setting up the system is under the over-all direction of Vinton W. Bacon, executive officer of the State Water Pollution Control Board, with each of the executive officers of the nine regional boards directing the work within his region.

River development

Private enterprise can handle it, too

In the course of recent hearings, the water resource task force of the Hoover Commission heard how and how not to develop natural resources. Admiral Ben Moreell's sub-group of the Commission on Reorganization of the Executive Branch of the Government was told by scores of interested organizations and individuals how and why the executive branch should abolish (or increase) services and thereby reduce (or increase) its expenditures on water resource projects.

To a great extent, many of those presenting briefs before the task force had some specific axe to grind, some definite project or proposed project in mind—generally a current or future project. One exception to this was the witness at the New York City phase of the hearing, who merely asked the task force to investigate the "Wisconsin Plan."

G. C. Neff, president of Wisconsin Power & Light Co., was the spokesman. He described a nearly 50-year-old program for development and control of water resources by private enterprise:

Under the "Wisconsin Plan" river flow is regulated, power dams are constructed, land is reforested and recreation facilities are developed—all with private financing. There is no government subsidy.

It all started in 1907 when the state legislature made possible the functioning of a Wisconsin Valley Improvement Company. This privately financed company has authority to build reservoirs, regulate stream flows and charge tolls to those benefiting from such regulation.

The State supervises what the company does with rivers; the Public Service Commission supervises what it charges for what it does. Tolls are meant to be well within the value of service to owners of dams on the river; yet they are sufficient to pay all costs of the company. Costs include a 6% return on investment in addition to local, state and federal taxes—in full.

Wisconsin Valley Improvement Company has built and now operates 21 storage reservoirs regulating a river running 26 privately owned hydro plants. Similar situations exist on other Wisconsin streams.

Flood dangers have been minimized on such rivers as the Wisconsin, Flambeau, Menominee and Chippewa—flood control costs being paid by utilities and industries in their tolls paid for the regulated flow.

Trees for Tomorrow, Inc., a nonprofit organization backed by five private utility companies and 12 paper mills has distributed 6 million free trees to Wisconsin farmers and planted another 3 million itself. It also prepares land management plans and sponsors conservation education.

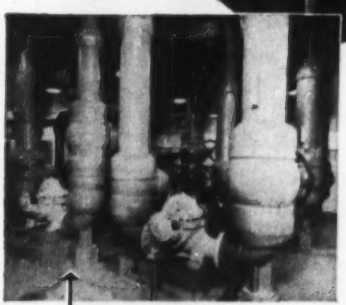
The Wisconsin Plan facilitates coordination of construction and operation of plants by private utilities —under surveillance of the State Public Service Commission. Electricity reaches 97.9% of farms in Wisconsin, where 12.5% more power than the national average for residential users is consumed at a 9% lower-than-average cost. And this is mostly steam power in a state with no coal, oil or natural gas of its own.

Mr. Neff asserted that the Wisconsin Plan has succeeded because state laws and business climate have been right. He said the private enterprise scheme has flourished under fair rules and adequate local regulation. He proposed that the plan, used generally throughout the U. S., would cut greatly expenditures by the federal government while increasing materially tax income at all government levels.

"The plan is worthy of your careful study," concluded Mr. Neff.

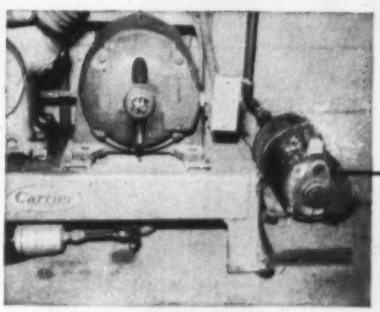
HOW TO SOLVE *an* AIR CONDITIONING PROBLEM:

PEERLESS PUMPS



Many a building like the Los Angeles Statler Hotel and office building uses type A pumps like this for air conditioning. *Specifications:* Capacities up to 70,000 gpm; heads up to 300 ft; hp range up to 150 hp; all types of drives.

It's all the Same to THE COMPLETE LINE OF *Peerless* PUMPS



Many a three room home uses a type PE pump like this for air conditioning. *Specifications:* Face mount and flexible-coupled designs; ¼ to 150 hp; capacities up to 5500 gpm; heads up to 260 ft; all types of drives.

Peerless builds THE BROADEST LINES OF WATER HANDLING PUMPS FOR AIR CONDITIONING OFFERED ANY MANUFACTURER — ***Send for Free Bulletins*** →

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FOOD MACHINERY AND CHEMICAL CORPORATION

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Offices: New York; Atlanta; Chicago; St. Louis; Indianapolis; Phoenix; Fresno; Los Angeles; Tulsa; Dallas; Plainview; and Lubbock, Texas; Albuquerque, New Mexico.
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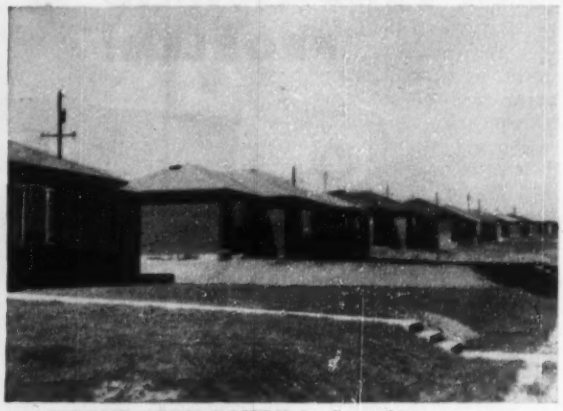
ENR

QUIET PASTURES in Denver area . . .



. . . SPROUT WITH TOWNS in the making.

New towns bloom in Denver farmlands and 11,000 homes will be the harvest

By Frank Pitman
ENR Correspondent

The new divided four-lane Valley Highway and the rapid growth of the city itself are responsible for the opening of several residential developments in the northern outskirts of booming Denver.

Del E. Webb, New York and Phoenix, Ariz., contractor is the latest to announce plans for the area. F&S Construction Co., headed by Sam Hoffman, is already at work there on a 5,000-home suburb.

Webb's plans are to join with the Aldon Construction Co., of Los Angeles, and build 6,000 three and four-bedroom homes and complete community facilities at a cost of more than $100 million.

Webb's engineers have made preliminary surveys of a 2,000-acre site on which he holds options, but construction is not scheduled to begin before early 1955.

Both Hoffman's and Webb's projects have been boosted by Colorado's Gov. Dan Thornton—Hoffman's community has been named Thornton, Colo.—since early planning stages.

• **More coming**—Other residential developments of a smaller scale are under consideration for the same area because of its easy access (about three miles) to downtown Denver via the new highway.

The partially completed freeway that ultimately will extend about 12 mi from Denver's northwestern to its southeastern limits, is now in use for a distance of six miles, from the north to the downtown area, but the rest is not due for completion for another three or four years.

Webb's project is planned for a site where the Valley Highway joins the Denver-Boulder toll road, another four-lane divided route, and Hoffman's F&S project is about two miles to the east. The latter, however is adjacent to U. S. Highway 87, which connects with the Valley Highway.

Webb and Hoffman say that residents of their projects can drive to downtown Denver in 15 minutes over the 50-mph, limited access routes.

• **Financing hurdle**—Long after acceptance of F&S plans, by the Veterans Administration, Hoffman's project was still faced with trouble in clearing FHA mortgages.

Thornton homes will depend upon wells as a source of water, and Eugene F. Duffy, FHA director in Colorado, based his disapproval for FHA-insured loans principally on that point.

Duffy, in announcing his disapproval, said, "they are building an entirely new city out there. It represents a far different type of risk from those we've insured before in Colorado," among the elements other than inadequate water supply, according to Duffy, were inadequacy of transportation, schools, shopping center and other community needs.

The Federal Housing Washington office later reversed Duffy's findings, however, and Hoffman staged groundbreaking ceremonies for what he called a $3-million shopping center and a 12-room school. The former will contain 14 retail units.

As a result of early approval by the VA, virtually all homes now occupied in the F&S development—there are about four hundred of them—are occupied by veterans.

• **What are they buying?**—Hoffman is offering brick veneer, three-bedroom residences at $10,250 and up. He has stepped up his building program since receiving FHA approval.

"We are finishing six homes a day, now," Hoffman said at the time.

"We will step that up to 12 houses a day and conduct an intensive sales campaign now that we have the FHA loans."

The $10,250 home provides 1,200 sq ft of area and is built with two bath rooms.

All assessments are included in the price of the dwellings. Streets have a 4-in. compacted base, two inches of bituminous concrete and a seal coat. They are constructed by F&S, but Adams County (where Thornton is located) has accepted the streets for maintenance, according to project manager R. Gasten.

Combination walks, curbs and gutters also were placed by the contractor. The concrete sidewalks are 3 ft-6 in. wide, and the gutters are 18 in. wide.

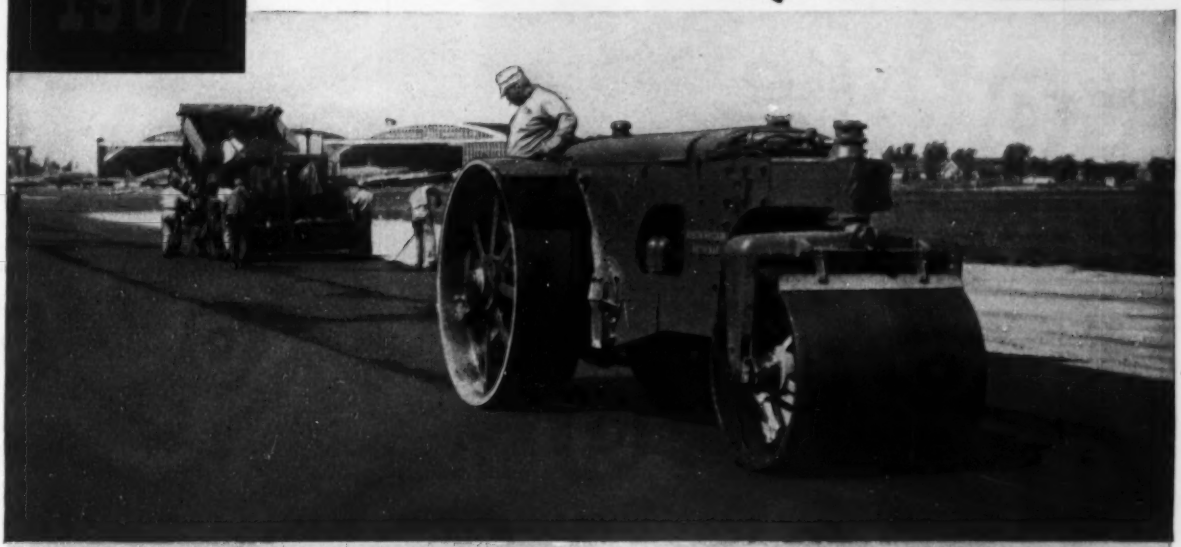
There are no storm sewers, because, according to Gasten, the surface drainage is adequate.

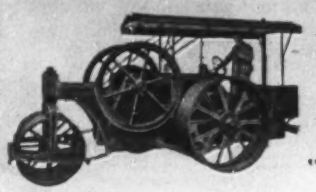
Water and sewer systems are being provided by the Northwestern Utility Co., Inc., a private firm capitalized at $50,000. Sam Joseph, vice president of the company said that homeowners pay a minimum charge of $4 for the first 5,000 gallons of water per month. There is a graduated scale for water consumption and each residence has a meter.

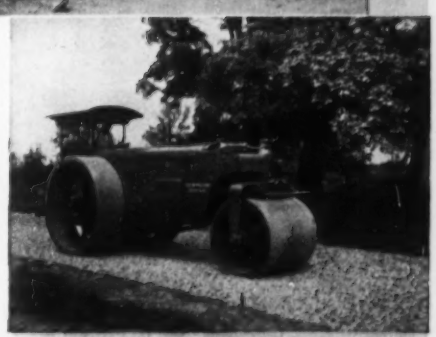
(Continued on page 50)

SINCE 1907

Famous for Dependability







They said it of the "one-lunger" of 1907, and they say it today . . . "Austin-Western rollers stay on the job day after day, and month after month, with less time lost for mechanical adjustments, maintenance and repair." That's DEPENDABILITY! Add to it the precision job of rolling that results from such things as Proper Weight Distribution, Vibrationless Power Units and Smooth Acting Clutches, and you have everything needed for top grade performance. The Autocrat is made in 10- and 12-ton sizes. Each has full-length side plates for maximum rigidity; low center of gravity for smooth operation, and hydraulic power steer. Each may be had with gas or diesel engine. Special equipment includes lights, sprinkling system, canopy top and powerful hydraulic scarifier.

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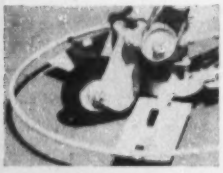
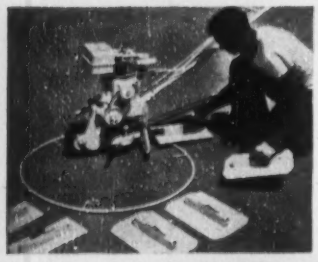
IT'S HERE!

The new White TROWELER with retractable wheel*



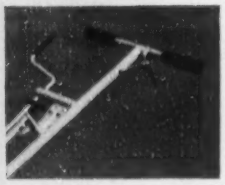
ONE MAN PORTABILITY

With retractable wheel in down position, operator easily wheels troweler from slab to slab or to truck, alone. Wheel controlled from handle.



10 SECOND RING AND BLADE REMOVAL

To clean blades, change from float to finish blades, or to wheel through narrow doorways ring and blades can be removed in a matter of seconds. Also power unit, ring, blades, and *handle* can be dismantled quickly and carried in the trunk of a car.



SAFETY THROTTLE CONTROL

Blade rotation automatically stops and engine idles if operator accidentally drops handle. Pitch of blades adjustable while troweler is in operation by convenient lever on handle.

ONLY THE White TROWELER HAS SO MANY LABOR-SAVING FEATURES

The Model T-1 troweler is a 36" machine of brand new design. It will do everything present style machines can do and *more!* And it's *ONE* man operation. Equipped with 4-cycle Briggs and Stratton engine. Wheel control, blade pitch adjustment, and safety throttle are located on the handle. Retractable wheel and a rubber-tipped stand hold the machine steady for disassembly. *Patent No. 2,621,568.

See it at your dealer's or write to factory for full details

WHITE MANUFACTURING COMPANY

ELKHART 7, INDIANA

MUNICIPAL

• **Own water plant**—Water for homes already completed comes from four wells—two shallow (40 feet), and two deep wells (one 750 feet and the other 1,450 feet).

In addition, the utility firm has 19 shares of Highline Canal Co., entitling it to some irrigation water.

A water treatment plant will be built to prepare canal water for domestic use later on, according to Joseph, but for now, the wells are providing an adequate supply. As more houses are built, additional wells will be drilled as needed.

The utility company has a 50-million-gallon storage reservoir for raw water and is constructing two covered concrete basins for storage of a total of 600,000 gallons of water after treatment.

The charge for sewer service to each home owner is $3 per month. Joseph said, "It probably will be lowered when we have 2,000 customers." At present there are about 600. The utility firm has constructed two primary treatment units at its sewage disposal plant and a secondary treatment plant has been built for additional treatment.

Gasten says that F&S will "build at cost" a 12-classroom school for the Adams County School district. Plans have been drawn by the school board and the construction will be done in accordance with the board's specifications on a 12-acre site donated by the developer.

Since there are no immediate plans for annexation by Denver, fire protection is provided by an already established Adams County rural fire department, which plans to station a volunteer-manned pumper at Thornton. Police protection will be drawn from the Adams County sheriff's office.

Webb is scheduling his construction program with aim taken at a completion date five years hence. He claims that his project will provide a payroll of $25 million a year during construction.

His engineers have found sufficient underground water to assure adequate supplies for his new city.

Webb says that he surveyed every western city before deciding to launch his project in the Denver area. The fact that the Atomic Energy Commission weapons plant at Rocky Flats is quickly accessible was an important factor.

The developer now is building a $20-million copper mining city at San Manuel, Ariz., and a $30-million housing project at San Diego, Calif.

(*Municipal continued on page 52*)

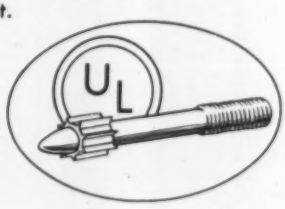
DRIVE-IT: 70% FASTER!

Pneumatic outlet racks anchored to concrete floor 70% faster than by conventional methods, electrical outlets to concrete walls in less than 20 seconds per bolt.

NEW EXCLUSIVE

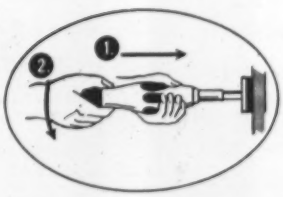
DRIVE-IT 320
WITH
BREAK-OPEN ACTION

Snap open action results in the fastest operating tool on the market. Easiest method to load and eject cartridges under any condition.



Drive pins are Underwriters' Laboratories approved.

Controlled Power. First and only tool which requires but one standard power load regardless of penetration desired. No need to buy and stock various strength power loads.



Three-way Safety. Cannot be discharged accidentally, due to the push and turn firing sequence. This, plus the large, swivel safety pad, makes DRIVE-IT triple safe.

More fastenings per hour with this speedy way of loading and ejecting cartridges.

DRIVE-IT
the original **POWDER-ACTUATED TOOL**

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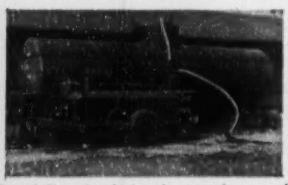
GRACE

3 sweeper models, axle, engine or tractor powered.

Sheepsfoot Rollers 250 to 600 psi.

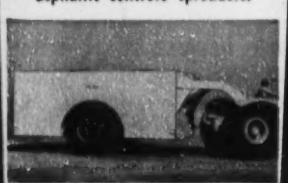
GRACE Asphalt and Compaction Equipment

Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.

Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

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Water survey covers 560 cities

How does your city compare with others in its efforts to keep ahead of water consumption with adequate supply? What is an adequate water supply? How does the present water situation compare with its supply and purification problems of forty years ago?

As a result of joint efforts of two divisions of the Business and Defense Services Administration of the U. S. Department of Commerce, these important questions can be answered.

The Water and Sewerage Industry and Utilities Division and the Area Development Division have published a report entitled "Community Water Supplies—Inventory and Adequacy," a compilation of data that was gathered from 560 cities in five classification groups, representing 548 separate water supply systems.

The average daily consumption in these cities is over 12 billion gallons, or an average of 150 gallons per capita daily. This is contrasted with a 1910 average daily consumption of 100 gpc.

The summary shows a total of 16 million services (nearly 13 million metered).

Assembled by the WSIUD, the material was correlated from information procured from the Water Resources Division of NPA, U. S. Public Health Service, Geological Survey, Community Facilities Service of Housing and Home Finance Agency, National Board of Fire Underwriters, American Water Works Assn. and the technical press.

• **The report**—Three pages of text are devoted to general information covered in the report and a discussion of its value and use.

The main portion of the report is in tabular form, with one page devoted to a national summary of the adequacy of public water supplies for major communities.

All five groups are treated in general on a nation-wide basis with tabulations of source, storage, treatment and distribution information broken down into 22 different items.

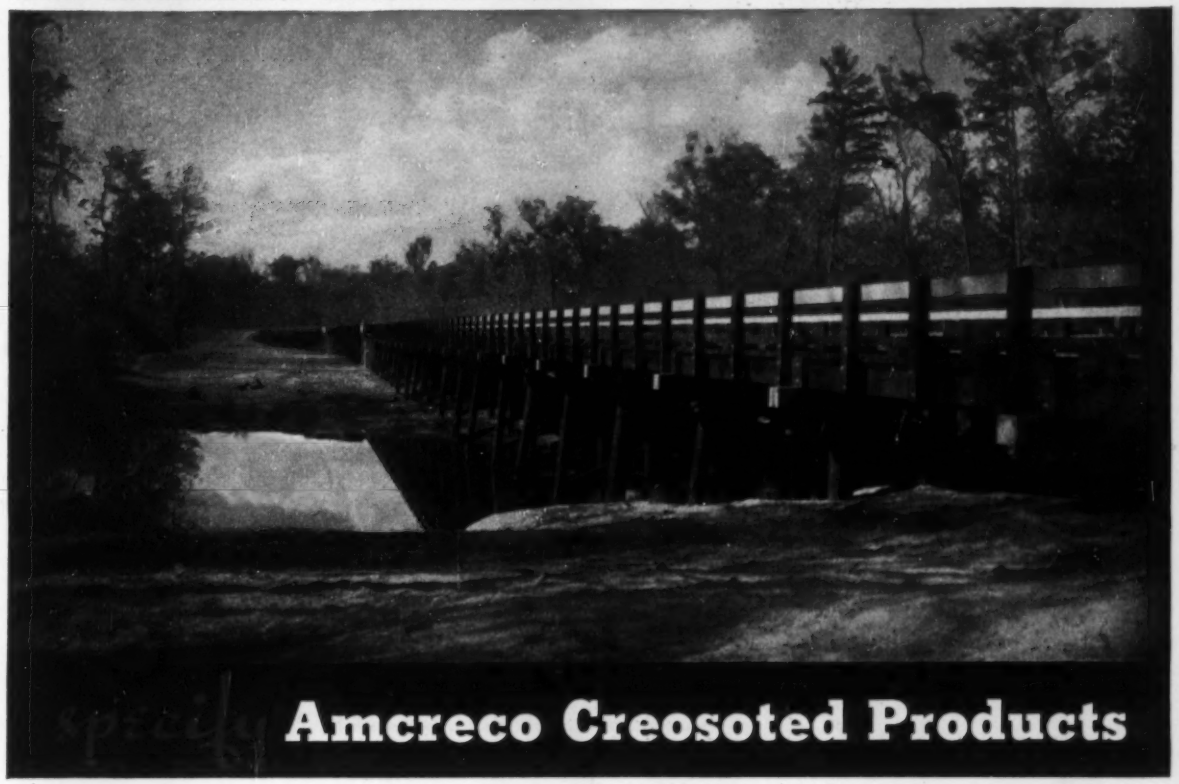
These same tabulated items com-

(*Continued on page 55*)

Old homes give way for new

Bulldozer attacks demolition site rubble as another slum home comes down. The scene—Indianapolis, which is one city that claims to be on schedule with its slum clearance program. Approximately 2,500 substandard homes are due to come under the wrecker's hammer during the next two years. In their place will be a low-rent housing project. John Hoffman & Son, Inc., already has torn down 350 homes in the area, and the operation shown is part of a 25-home demolition contract awarded to the Hoffman firm when the city acquired title.

For Bridge Work where low first cost and minimum maintenance are essential . . .



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Timbers • Piles • Planking
Framed Bridge Timbers
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Attractive, highly serviceable bridges can be built economically when you use Amcreco Creosoted Piles, Bridge Timbers and Planking. Service records prove that Amcreco's advanced treating techniques used on these materials result in longer service life and less maintenance. We will be happy to show you the proof!

Plan now to take advantage of Amcreco's long experience on your next job. Our engineers are ready to work with you.

Pressure treated for strength that lasts

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GENERAL SALES OFFICE — CHICAGO, ILLINOIS

WILL YOUR NEXT BID INCLUDE THE "FINAL FACTOR"?

Many times a low bond rate can be the *final factor* that tilts a bid in your direction.

How can you make sure of this *final factor* in your bids? Ask your Indemnity Agent to establish your credit line with Indemnity Insurance Company of North America. This large independent company offers the lowest bond rates* to contractors of *skill, integrity* and *responsibility*.

You save money on these low rates. An established credit line assures you of getting bonds on future jobs without delay. See your Indemnity Agent now.

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Philadelphia 1, Pa.

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NORTH AMERICA

One of the North America Companies, which are headed by Insurance Company of North America, founded 1792

prise the balance of the report, treating each city with individual information.

• **Here's what they offer**—A breakdown of each community by district and population group, with 1950 census population and estimated number of people served.

Next is ownership, whether privately or municipally owned, then the tabulation of supply data is treated.

Items of impounded storage, safe yield of watershed or stream, transmission capacity in mgd, safe yield of ground water, raw water storage and pumping are tabulated.

Treatment plants are next studied with rated capacity and overload capacities shown, followed by clear water storage and service pumping capacity.

Distribution is presented in five columns, ground distribution and elevated distribution, average output in mgd, maximum month, and maximum day.

This information is followed by the number of services and the number of meters in the cities treated, thus giving the user a standard of measurement with which to compare his city with those in the report.

Copies of the survey may be obtained from the Department of Commerce, Washington, D. C., at a price of 25 cents each.

Cities balk on sewage report

Only two Nebraska cities fronting on the Missouri River—Omaha and Plattsmouth—met the July 1 deadline for reporting on their plans to reduce stream pollution.

When the state health department asked seven Missouri River communities to report (the requirement is in compliance with federal law), all cities were expected to present plans for long-range programs for treating the sewage which now is dumped raw into the river.

State Health Director E. A. Rogers states that reminders will be sent to the five delinquent municipalities, Niobrara, South Sioux City, Dakota City, Bellevue and Nebraska City. He said the cities will be told that the health department's request was "prompted by an official notice from the U. S. Public Health Service."

Under federal law, Dr. Rogers pointed out, "the Federal Government can start legal action to end stream pollution if the states do not devise a solution of their own."

(*Municipal continued on page 56*)

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Flintseal* **saves you**

per mile of joints

For mile after mile of trouble-free and economical concrete pavement joints, specify FLINTSEAL.

A rubber-asphalt hot-poured compound, Flintseal *holds* its bond and *seals* out water *positively* through all weather. Won't crack or fail in cold. Won't flow or smear in heat. Stays extensible and compressible through expansion and contraction of the pavement slabs. Remember, for every mile of pavement you have approximately two miles of joints.

One application of Flintseal lasts for years . . . and years. That's how you can save.

And specify FLINTSEAL JFR (jet fuel resistant) to seal joints in critical areas on air fields.

Both FLINTSEAL and FLINTSEAL JFR meet State and Federal specifications. ★ Send for complete technical information today.

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Over 50 Years Specialized Experience at Your Service . . . by 'phone, mail or personal call. No obligation.

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SEE RUST-OLEUM APPLIED
DIRECTLY OVER RUSTED SURFACES!
SEE PROOF OF PERFORMANCE! MAKE
THIS TEST UNDER YOUR OWN CONDITIONS!

See Rust-Oleum 769 Damp-Proof Red Primer applied over a rusted surface after scraping and wire-brushing to remove rust scale and loose rust in the Rust-Oleum *"rusted panel demonstration."* Rust-Oleum's specially-processed fish oil vehicle *penetrates* rust to bare metal . . . saving time, money, and metal!

Beautify as you protect with colorful Rust-Oleum finish coatings. Specify Rust-Oleum for new construction, maintenance, and re-modeling. See Sweet's for complete catalog and nearest Rust-Oleum Industrial Distributor, or attach coupon to your business letterhead.

There Is Only One Rust-Oleum. It Is Distinctive as Your Own Fingerprint.

Protects Tanks, Girders, Gutters, Metal Sash, Fences, Roofs, Machinery, Stacks, Pipes, etc.

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STOPS RUST!

Resists Rain, Sun, Fumes, Snow, Heat, Salt Water, Salt Air, etc.

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- ☐ Test Application of Rust-Oleum Over Rusted Metal Surfaces in My Plant.
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Municipal briefs . . .

• **Another river gets the clean-up treatment**—Raleigh, N. C., voters have furthered a clean-up campaign to help rid the near-by Neuse River of pollution by approving a $2.1-million bond issue for construction of a sewage disposal plant.

• **First bridge after 15 years**—After 15 years of talking and planning, the Indiana Toll Bridge Commission has started work on its first bridge. Initial contracts already have been let with authorization to begin "limited work" on the $3-million bridge over the Wabash River. Bonds—not to exceed $2.6 million—are going to be sold next month.

• **One day's court docket: 3,273 landlords**—The Housing and Buildings section of Municipal Term Court of the City of New York had its busiest day, recently, when 3,273 tenement owners were hailed before the judge for violations. They are a part of 100,000 violators that, according to Chief Magistrate John M. Murtagh, would be brought to court before Sept., 1955. His prediction—"this city of slums will be a city without slums by March, 1956."

• **Regional planning still spreads**—Creation of a County Planning Council for coordination of city planning at county level is being studied by officials of Rochester, N. Y. The plan calls for the establishing of planning commissions in 19 towns and a county council of representatives of each commission.

• **Fights legalities**—The City-County of Honolulu has won a round in its fight to cut legal obstacles stalling development of its off-street parking system, but has others to cope with before it can proceed. A circuit judge has refused a new trial for a landowner who is attempting to prove that the assessment system is invalid—however there are three similar suits pending.

• **Eight big additions**—The Indianapolis Board of Sanitation has ordered preliminary engineering surveys on eight additions to the city's interceptor sewer system. Included (at a total cost of about $15 million) will be extensions to several large subdivisions recently annexed, or awaiting annexation. Major part of the cost will be for increased capacity on mains.

"T5X helped us maintain 20-hour-a-day schedules."

Gunar Nygard, project superintendent, Morrison & Knudsen Co.

"On the Frog Lake Dam project near Estacada, Oregon we used a variety of Union Oil products with excellent results.

"Union's high quality lubricants such as T5X motor oil, Unoba and Red Line greases helped us to maintain rugged 20-hour-a-day schedules with our heavy earth-moving and hauling equipment."

T5X and other Union Oil products help keep equipment like yours working under some of the most adverse conditions on earth.

For the solution to any specialized problems involving fuels and lubricants get the recommendations of a Union Oil "lube" engineer. He knows from experience what's right for *your* equipment on *your* job.

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OF CALIFORNIA

Los Angeles: *Union Oil Bldg.* • ***New York:*** *45 Rockefeller Plaza* • ***Chicago:*** *1612 Bankers Bldg.* • ***New Orleans:*** *644 National Bank of Commerce Bldg.* • ***Atlanta:*** *401 Atlanta National Bldg.* • ***Kansas City, Mo.:*** *921 Rialto Bldg.*

Economy in construction is important . . . so important, that Builder, Designer and Owner are analyzing construction costs realistically,

the NEW ROOSHOR gives greater job economy!

it's NEW

THE ROOSHOR (WITH EXTENSION HEAD)

The new Rooshor, *extension type*, 8 ft. to 14 ft. (full 6 ft. adjustment) can be used as a flat-head shore, a male-head shore and as an extension shore by merely inserting any length S4S 4 x 4 into the steel head. It is instantly adjusted to "hairline" accuracy and has no pins or screw adjustments to become clogged or cause needless delays. Wooden upper members permit easy fastening of lateral or diagonal bracing.

THE STANDARD ROOSHOR (WITH WOOD HEAD)

The adjustable shoring device offering instant and accurate adjustment within the range of three sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and, 5 ft. to 9 ft.

ROOS COLUMN CLAMPS

Consists of two identical hinged units that eliminate waste time in fitting and adjusting . . . foolproof . . . no wrong way to put them on. There are no loose parts to cause needless delays and a hammer is the only tool needed.

"USED BY CONTRACTORS COAST-TO-COAST OVER 35 YEARS"

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities.

Write for Bulletin 334.

BAKER-ROOS, INC.

602 W. McCARTY ST. • INDIANAPOLIS 6, IND.

INTERNATIONAL

India abandons plan for 783 ft Kosi Dam

A favorite dream of Indian engineers for many years—a dam that would break the world's height record—finally has been removed from the "future projects" class, and a more modest solution adopted for the water-wasting, flood-destroying Kosi River, which drops out of the Himalayas and joins the Ganges River about 300 miles north of Calcutta. The original plan envisaged a dam 783 ft high across the Kosi at Chatra in Nepal, with canals along either bank that would feed irrigation water to 3.8 million acres, and a 1.8 million kw power installation. The project—costing a total of $350 million—was to be carried out in seven stages. Several times work on stage one was reported to be ready to start.

When the 680-ft Bhakra Dam and numerous others in the country's five year development plan were undertaken, however, the expensive Kosi scheme was pushed farther into the future, and a low (85 ft) dam substituted. The low dam would have cost $130 million, and provided irrigation for 2 million acres.

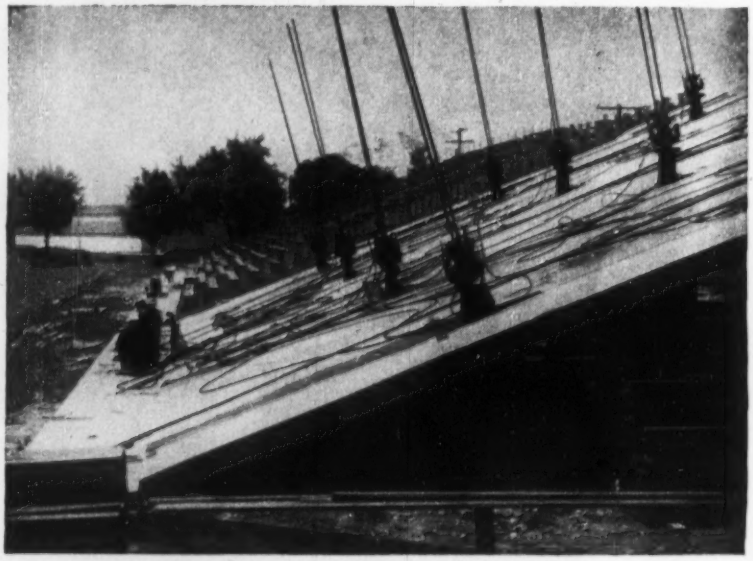
Now it is reported that both the high and low dam schemes have been definitely abandoned in favor of a diversion barrage plus confining the river in embankment for 70 miles as a flood protection measure. The reasons given for abandoning the original schemes are that both the low and high dams were located in earthquake regions, that the high dam was too costly, and that the low dam only would have reduced the peak flood discharge from about 950,000 cfs to 460,000. The Central Water and Power Commission estimates that the new Kosi project can be built for $80 million and in a period of about 6 years.

Venezuela plans steel mill —power plant to serve it

Venezuela plans to build a $60-million steel mill on the Orinoco River near Puerto Ordaz—plus a $40-million power plant to serve it.

The mill—expected to be in opera-

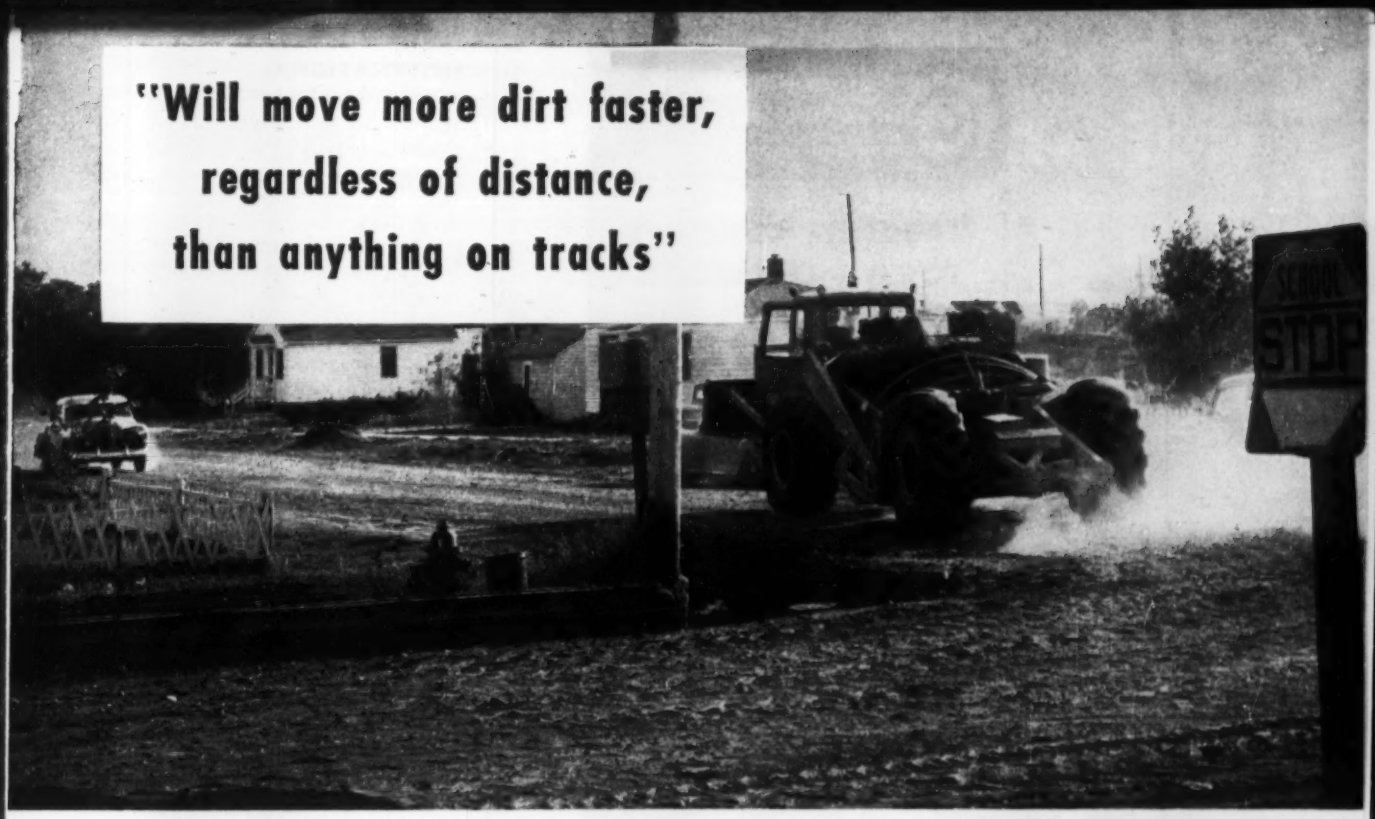
(*Continued on page 60*)



Tilting a lift-slab for a grandstand

In Winnipeg, capital of Canada's Manitoba, grandstand construction has placed a new twist on lift-slab work. A grandstand to provide 3,800 seats was built in three major sections: three lift-slabs were cast on ground around columns and raised by 12 jacks operating at varying rates of speed so that the back of the slab would attain the maximum elevation and the front toe of the slab would remain on grade. Slots were formed around the columns before pouring the slab to give the necessary play in the tilted raising operation. Adjacent slabs were joined by a 4-ft poured-in-place strip, and wooden seats placed after columns had been concreted. Cowin & Co., Ltd., structural engineer; F. R. Lount & Son, architectural designer; Hamilton Construction Co., Ltd., contractor (all of Winnipeg).

"Will move more dirt faster, regardless of distance, than anything on tracks"



Hauling 600′ along city street, Tournapull averages 9 mph. Four-wheel, multi-disc air brakes, power steer are important safety factors in this school district.

"I've worked with earth-moving machines for years," says Vernon Testerman of Belden, North Dakota, "and I've found the 7-yd. D Roadster the fastest machine on wheels. It travels anywhere at a steady 25 mph. I can go anywhere I want with it, without being stopped at weighing stations. It does each job good and fast. I truthfully believe it will outdo a tractor and scraper, or other equipment, in building a mile of road. And it will move more dirt faster, regardless of distance, than anything on tracks."

Moves 95 yds. hourly self-loading on 900′ cycle

Take the "D's" performance leveling and landscaping the illustrated 73,000-yard, 90-unit, housing site in Minot, North Dakota, for example.

Here, D Tournapull self-loaded 5 pay yards of sandy loam every minute. 900′ cycles took an average of 2⅔ minutes. Output per 50-minute hour averaged 19 loads (95 pay yds.). Output per 10-hour day, according to Contractor Testerman, was about 1,000 pay yards.

77 yds. hourly push-loaded on 1600′ cycle

On another job in Minot — grading city streets prior to paving — Tournapull was push-loaded with 5½ pay yds. of sand and clay in as little as 35 to 45 seconds. Haul of 600′ over city streets past a school district averaged another minute. Complete 1600′ cycle took 3.7 minutes. Output per 50-minute hour averaged 14 loads (77 pay yds.).

Drives over main highways

Travel speed between these 2 jobs reached 25 mph in city traffic. On a longer highway move — from Minot to Fargo — the "D" averaged 26 mph — made the 270 miles in 12 hours.

You've probably read many LeTourneau-Westinghouse job reports like this . . . telling how other contractors have gained speed and flexibility with D Tournapull. Isn't it time you checked what one of these dirtmovers can do for you? It pays off either as a one-man self-loading utility tool or a production dirtmover in pusher fleets! Call us. We'll be glad to demonstrate Tournapull for you on either type of work.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-573-8-b

With pusher (above) "D" heaps 5½ pay yds. of sand and clay in 45 seconds and 150′. Self-loading (below), rig picks up 5 pay yds. of sandy loam in 60 seconds and 180′.

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

For "an unblemished architectural surface"
Atkinson and Trepte Cos. use

MASONITE CONCRETE FORM PRESDWOOD

Donald M. Sharp Memorial Community Hospital, San Diego, California. Joint Contractors: Guy F. Atkinson Company and Trepte Construction Co., Inc.

"We are very pleased that we are obtaining an average of 6 re-uses," writes M. R. Montgomery, project manager. "Masonite Concrete Form Presdwood® was used for all exposed form work on this job.

"The number of re-uses has not been limited by the life of the material," he says, "but rather by mechanical injuries and the requirements of an unblemished architectural surface."

These grainless, all wood hardboards will help you save 3 ways:

1. Use the smooth side when you need a smooth surface to be painted or left unpainted.
2. Use the screen side for architectural concrete to provide a better paint bonding surface.
3. Use the screen side on concrete work where carborundum rubbing is specified—cuts hand rubbing costs 50% or more.

Extra advantages that work for you!

- Low first cost. Less than ½ that of other smooth-surface methods.
- Can be used again and again.
- Can be curved for arches, columns, etc.
- Easily worked with ordinary carpentry tools.
- Won't split, splinter or crack.
- Large 4′ x 8′ and 4′ x 12′ panels handle easily, create fewer fins.

NATURALLY STRONGER WITH LIGNIN
PRESDWOOD WOOD MADE BETTER
MASONITE® CORPORATION
Dept. ENR-812, Box 777, Chicago 90, Illinois

Please send me sample and your booklet on Concrete Form Presdwood.

Name.....
Firm.....
Address.....
City.....Zone.....
County.....State.....

"Masonite" signifies that Masonite Corporation is the source of the product

tion by the end of 1957 or early in 1958—will have an initial capacity of 150,000 tons a year. Ore will come from the Cerro Bolivar field of U. S. Steel Corp.

The hydro-electric plant will be built by the Venezuelan Development Corporation on the Caroni River, which flows into the Orinoco at Puerto Ordaz.

To train personnel for the mill, Venezuela's Central University will set up a school of metallurgical engineering. Meanwhile, fellowships will be granted Venezuelan students for study abroad to prepare for administrative posts at the new project.

International briefs . . .

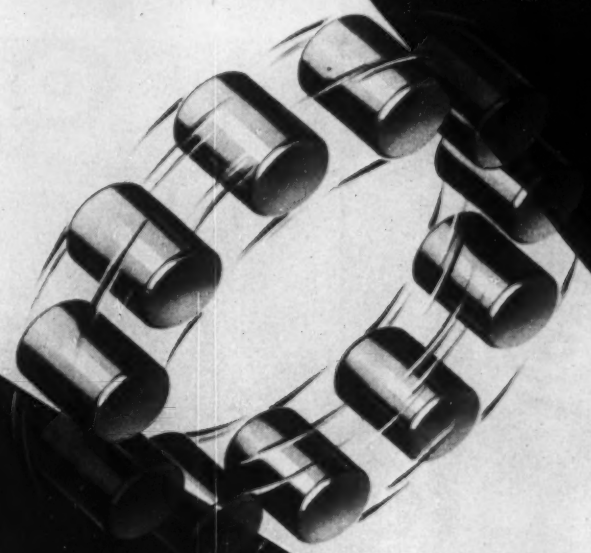
• **Cuban development**—A long-term development plan to be financed by bond issues amounting to $350 million is now before Cuba's consultative council for final action. The program involves building new roads, schools and a hydroelectric plant; improving water supply; using sugar cane waste to make paper. The initial bond issue would be for $100 million.

• **British Columbia bridge**—Construction of a new toll bridge across the west arm of Kootenay Lake, B. C., to replace the existing cable ferry between Nelson and the north shore of the lake has been announced by the B. C. Toll Highway and Bridge Authority. The Authority also is considering building an $8-million toll bridge across Okanagan Lake at Kelowna.

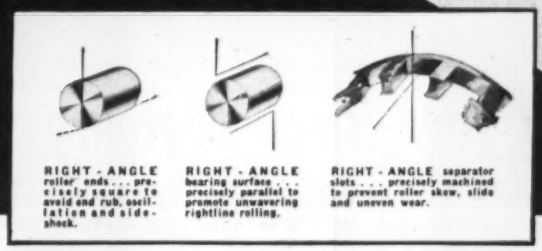
• **Arab expressway**—Both an American-Lebanese economic aid agreement and Lebanon's budget have allocated funds for construction of the first sections of a project long sought by Arab states—a Mediterranean Sea-to-Persian Gulf truck expressway. Money will be used to build (1) a section from Beirut to the North Lebanese commercial center of Tripoli; (2) part of the main highway trunk from Beirut over the Lebanese and Anti-Lebanon mountains to the Syrian frontier near Damascus. Syria, Jordan, Saudi Arabia, Kuwait and Iraq are expected to appropriate funds soon for their sections of the expressway.

• **Road to the sea**—Deposits containing at least 22,000,000 tons of high grade iron ore have been discovered in Gebel el Ghoraby, some 12 mi from Egypt's Baharia Oasis. One result of the find: a 124-mi highway will have to be built to connect the area to the nearest seaport.

UNWAVERING ORBITAL ROTATION



Because every surface is precisely square . . . precisely parallel. No skew . . . No skid . . . No oscillation



RIGHT-ANGLE roller ends . . . precisely square to avoid end rub, oscillation and side-shock.

RIGHT-ANGLE bearing surfaces . . . precisely parallel to promote unwavering rightline rolling.

RIGHT-ANGLE separator slots . . . precisely machined to prevent roller skew, slide and uneven wear.

ROLLWAY right-angle solid cylindrical roller bearings

Loaded at right angles, with no diagonal components to impose skew forces. Precisely square and parallel from every surface aspect. The solid cylindrical rollers of Rollway Right-Angle Roller Bearings follow the right-line motion of Newton's first law, providing *unwavering orbital rotation around the shaft.* Internal friction and heat are held to a minimum. Maintenance attention and replacement costs are low . . . life and load-performance qualities surprisingly high.

Our engineers will gladly assist you in selecting the best bearing for your particular needs. Complete engineering and metallurgical services are always at your command. No cost. No obligation. Just write or wire. Rollway Bearing Co., Inc., Syracuse, N. Y.

ROLLWAY BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

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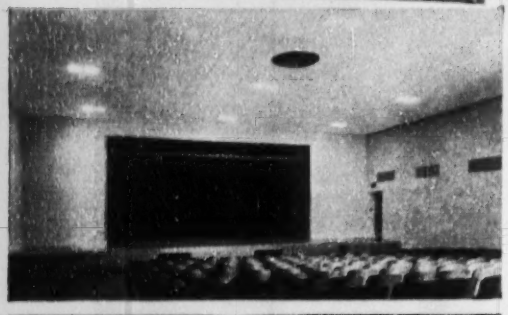
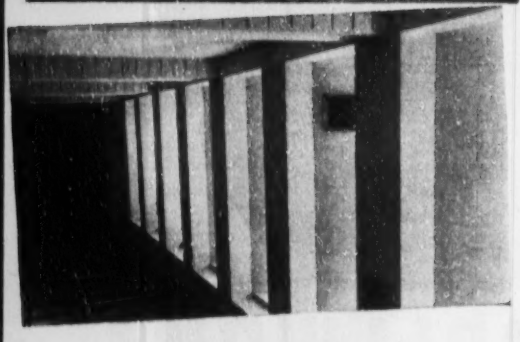
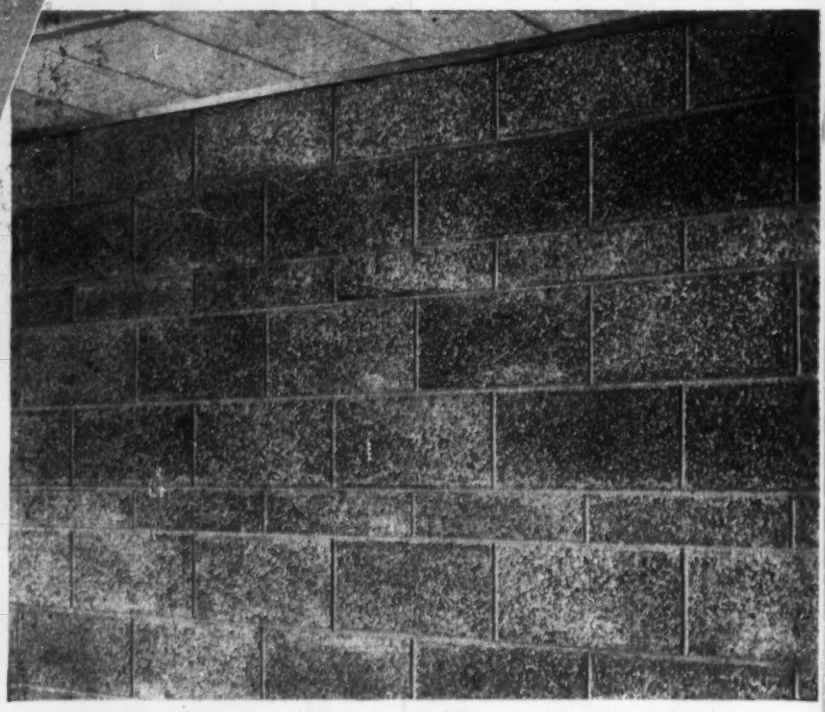
Build Better with VIBRAPAC Block

Detail in the office of a well-known manufacturing plant — Vibrapac Block — 2 course 8" high and 1 course 4" high. (Unretouched photo)







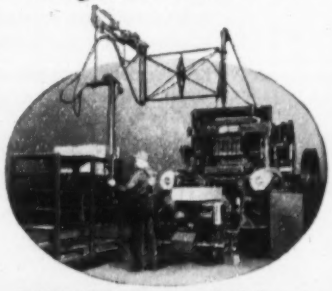
Make Your Block Masonry Dreams Come True!

NOW you can create distinctive exteriors and interiors *at low cost* . . . because VIBRAPAC Better Block combines beauty, utility and permanence that compares favorably with any other masonry material. You build a reputation with every structure you erect using this highly regarded, economical block masonry.

Consistent Exterior-Interior Masonry Harmony

Coordination of exterior and interior design are assured with VIBRAPAC Block . . . plus light structural load advantages, ruggedness, firesafety, superior insulation values and minimum maintenance cost. See your nearest VIBRAPAC Block Producer . . . or write to

BESSER MANUFACTURING CO.
Box 181, Alpena, Michigan, U. S. A.



BESSER VIBRAPAC . . . The fully automatic concrete block machine . . . produces high quality modern masonry units of any desired texture or density . . . AT LOW COST!

BESSER
50th Anniversary
1904-1954

. . a Half Century of Concrete Masonry Progress!

MEN AND JOBS

Vogel, named to head TVA, tops long Army career

Brig. Gen. Herbert D. Vogel, who is credited with the introduction of large-scale experimental hydraulics into the United States, is slated to take over as chairman of the Tennessee Valley Authority at a time when the agency is the center of a violent political storm (see also editorial, page 128).

But times of stress are no new experience for Vogel, who will wind up a two-year term as southwestern division engineer for the Corps of Engineers at Dallas (ENR Aug. 7, 1952, p. 75). During his term in Dallas, Gen. Vogel has been, in addition, chairman of the Arkansas-White-Red Basin Inter-Agency Committee, which has been wrestling with the knotty question of local, state and federal rights in soil and water development; a member of the Board of Engineers for Rivers and Harbors; and Department of Army representative on the International Boundary and Water Commission for the Rio Grande.

• **Long public career**—Most of the new TVA head's long Army career has been in public hot-spots.

A native of Michigan, he graduated from West Point in 1924, studied engineering at the University of California, took a Doctorate in Engineering at the University of Berlin in 1929, and returned to the University of Michigan to study experimental hydraulics in 1933.

In 1930 he constructed for the Corps of Engineers the U. S. waterways experiment station at Vicksburg

(Continued on page 66)

Here's Why

THURMAN Portable SCALES

"Can Take It"

MANY MOVED 30 TIMES

☑ **PORTABLE** Move Thurman Portable Heavy-Duty Truck Scales as a unit, — they're engineered to be transported from job to job and retain their weighing accuracy. Concrete pits are not required. Place the end stands on solid, firm ground — "ramp-up" at both ends with stone or dirt and you're ready to weigh.

☑ **RUGGED** These precision-built heavy-duty Portable Truck Scales weigh accurately and are built to "take-it". Hundreds of Thurman Scales have been moved to over 30 different locations during a period of several years. Rugged service like this, illustrates how well these scales are designed for portable weighing.

☑ **PROVEN** Many contractors and road builders throughout the country who have used Thurman Portable Scales, like them to the extent that they now have several Thurman Scales in constant use. For more complete information on deck length (18 — 43 ft.) and load capacities (20 — 50 tons), write for our folder: "Accurate . . . Portable Weighing".

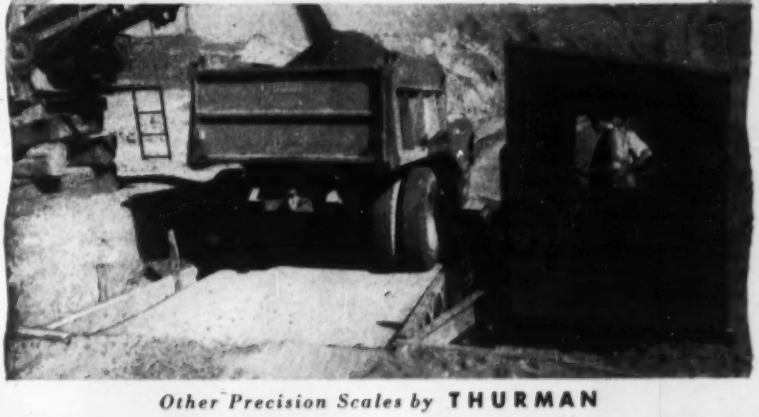
the THURMAN

PRECISION PRODUCTS since 1918

MACHINE COMPANY

Scale Division

DEPT. B, 156 NORTH FIFTH STREET • COLUMBUS, OHIO



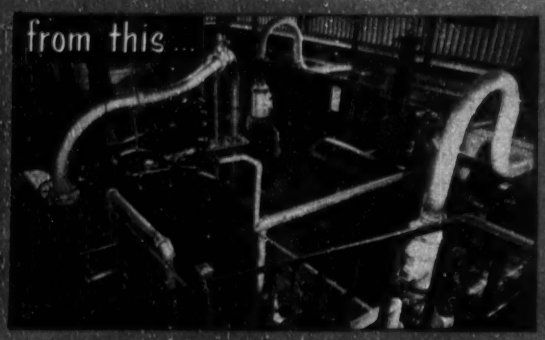
Other Precision Scales by **THURMAN**

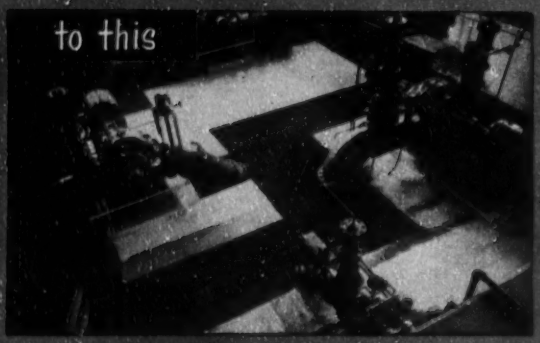
Batching Electronic | Industrial Liquid Weighing | Pipe Lever-Hopper Pit Scales | Warehouse Wheelbarrow

Allis-Chalmers Helps Binghamton

WATER

Paces Population—Business Growth!





TOP: Portion of pump room before conversion. Photograph shows old type pumps and steam engines used for pumping raw water. Notice crowded condition in this view.

BOTTOM: Same view after conversion, showing four Allis-Chalmers pumps for pumping raw water to mixing chamber — two 11,000,000-gpd, one 15,000,000-gpd, and one 3,200,000-gpd unit.

TO keep ahead of rapid population and business growth which has increased average daily water pumpage 1,500,000 gallons in two years, Binghamton, New York, has expanded and modernized their water works facilities. Old, outdated steam engines and inadequate pumps have been replaced with modern Allis-Chalmers municipal pumping equipment.

Binghamton is located at the confluence of the Susquehanna and Chenango Rivers in upstate New York. It is the hub of an area often called "An Empire Within the Empire State." Binghamton itself is an important industrial community of over 90,000 population which manufactures over 330 different products for the home and industry; its surrounding area is rich in fertile farm lands.

Water supply for the city of Binghamton is secured from the Susquehanna River. An average daily consumption of 9,516,846 gallons was recorded in 1953. Allis-Chalmers centrifugal pumps are used in every pumping operation, and vary in size from small 200 gallon per minute reservoir pumps to a large 15,000,000 gallon per day unit pumping raw water into the mixing chamber of the filter plant.

When *your city* plans expansion or modernization of water works facilities, do as Binghamton and other progressive communities are doing — take advantage of Allis-Chalmers many years' experience in municipal pumping equipment. Call your nearest A-C sales office for complete information, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

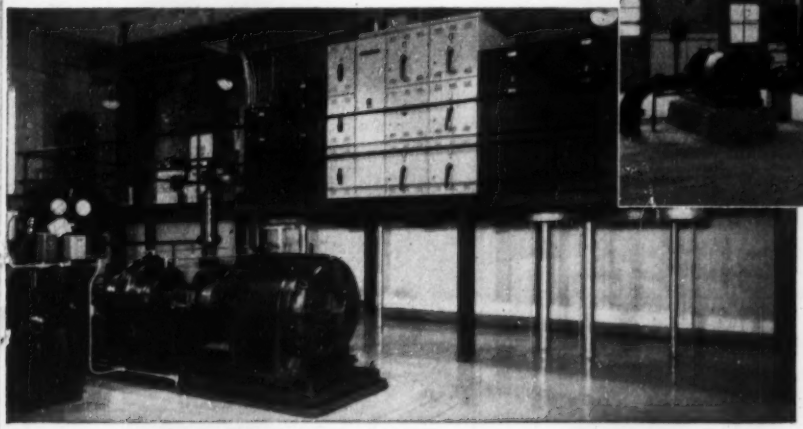
A-4352

ALLIS-

Modernize and Expand Water Works

An aerial look at Binghamton, New York, located at the confluence of the Susquehanna and Chenango Rivers. City covers an area of 9.38 square miles and has a population of over 90,000.

View of pump room, showing 12 by 10, 10,000,000-gpd Allis-Chalmers centrifugal pump and Allis-Chalmers switchgear and motor controls. Power for plant is supplied from three 500-kva Allis-Chalmers power transformers.



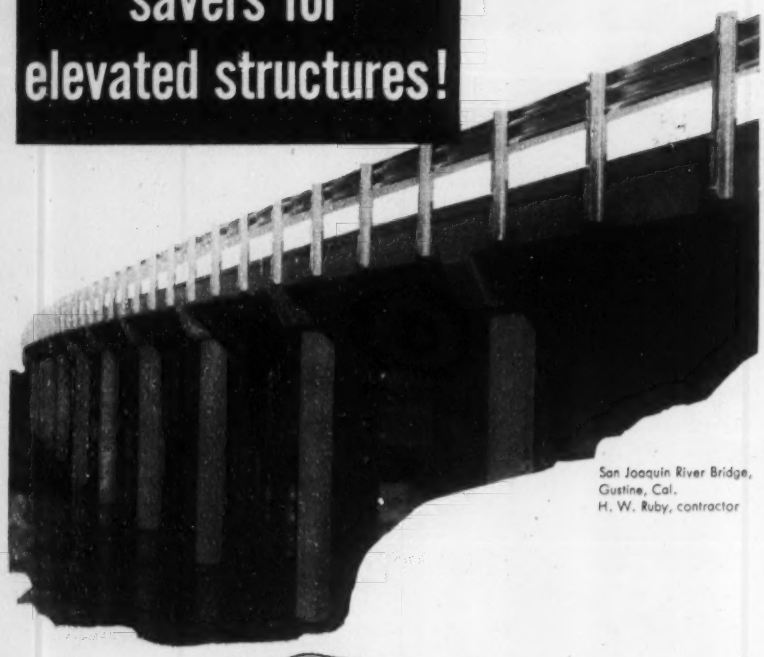
Two 14 by 12, 10,000,000-gpd Allis-Chalmers centrifugal pumps forcing clear water into distribution system. Four pumps feed 149 miles of water mains. Excess water is distributed to five reservoirs.

CHALMERS

A-C ALLIS-CHALMERS

Builders of the World's Widest Range of Public Works Equipment

Time and money savers for elevated structures!



San Joaquin River Bridge, Gustine, Cal.
H. W. Ruby, contractor

Sonotube®

FIBRE FORMS

for round columns of concrete

Corrugated steel casings, driven to refusal, were used to form the below ground sections of these concrete piers.

16" I.D. Sonotubes were used to cap the piles and form the exposed sections of the piers.

Because SONOTUBE Fibre Forms can be sawed to specific lengths on the job it is possible to fit the forms to the varying heights in the profile of the ground surface in minimum time. And because SONOTUBES require little bracing, less time is required for erection.

Low cost SONOTUBE Fibre Forms are lightweight and easy to handle.

Widely used by contractors and approved by engineers and architects everywhere, SONOTUBE is proven to be a fast, economical method of forming round columns of concrete.

SONOTUBES are supplied in 31 sizes, 1" I.D. to 36" I.D.—up to 50' long.

See our catalog in Sweet's

For complete technical data and prices—write

SONOCO PRODUCTS COMPANY
Construction Products Division
LOS ANGELES, CAL. — HARTSVILLE, S. C. — MAIN PLANT — MONTCLAIR, N. J.
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sonoco
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and was in charge of its operations until 1934.

During World War II he saw service in the South Pacific, the Philippines and Japan and served as lieutenant governor of the Panama Canal Zone before taking over the southwest district two years ago.

• **Practical man**—Despite his extensive formal training, Vogel is an advocate of the practical approach to engineering and other problems. "Academic knowledge is of value only when it has an ultimate application in the service of humanity," he commented recently.

He has long been an advocate of getting into the field, finding out the details of the problem at first hand and in human terms before turning loose his own and his staff's technical knowledge.

"Our job," he said, ". . . is not to show how much we know about soil conservation and water development but primarily to help the people make better use of their soil and water and secondarily to give those who follow us the value of the experience we gain."

Ebasco engineer becomes new president of firm

Frederic C. Gardner, formerly executive vice-president of Ebasco Services, Inc., has been named president and chief executive officer of the construction, business consulting and engineering firm.

Mr. Gardner, a graduate of North Carolina State College, joined the concern immediately after his graduation in 1917, and has been with Ebasco or its associated companies since that time. Starting as a draftsman, he became engineering manager in 1943. He became a vice president in 1945, and was named executive vice-president in 1952.

The new president succeeds another engineer—T. C. Westcott, who moved up to the post of vice-chairman of the board. Mr. Westcott, an engineering employee of Ebasco since 1911, was construction manager of the New York office from 1924 to 1931, and had been president since 1945.

New York housing head leaves Senate committee

Joseph P. McMurray, a member of the professional staff of the Senate Banking Committee since 1948, has accepted the position of executive director of the New York city housing

authority and will assume his new duties around Aug. 1.

McMurray has specialized in housing legislation since joining the Senate committee and handled all housing legislation for the committee since 1948, including the housing act passed last week by congress.

His job will be to administer the operation of an authority that employs over 4,000 persons and carries on perhaps the laregst residential rental program in the United States. In addition to administering 80,000 municipal low-cost housing units, the authority also handles the New York state and federal housing programs located in New York City.

McMurray, 42, attended Brooklyn College and came to Washington in 1940 as a junior economist.

Men and Jobs briefs . . .

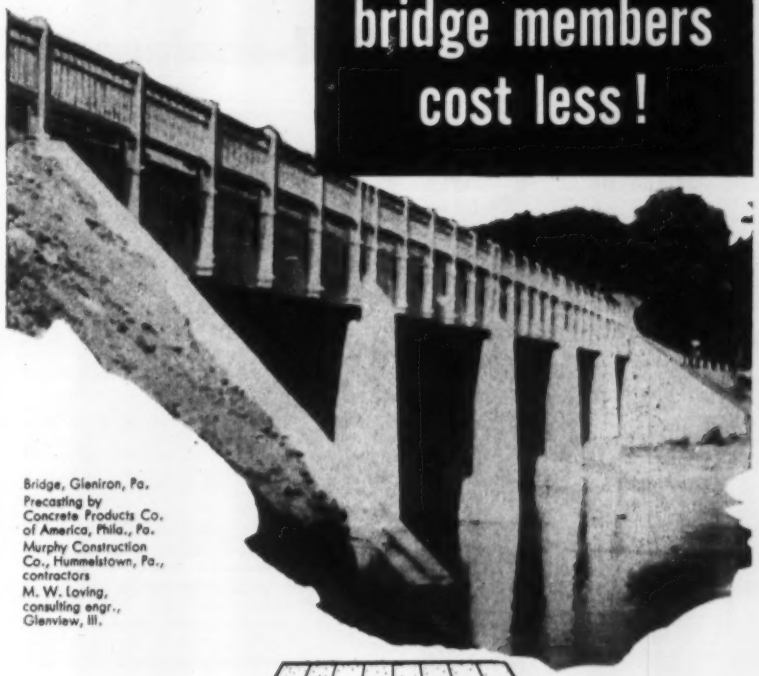
• **Careers—Frank C. Morgain,** head of civil engineering at Cooper Union, New York, becomes dean of engineering at North Dakota Agricultural College . . . **Daniel N. Mandell,** acting director, becomes director of operations for the Port of New York Authority . . . **Ralph P. Johnson** named assistant manager for engineering, construction and test operations for the Santa Fe Operations Office, AEC . . . **Robert M. Hagan** becomes chairman of the department of irrigation on the University of California campus at Davis, Calif.

• **Retirements—Lawrence C. Whitsit,** Highland Park, Mich., city engineer, after 40 years of city service . . . **James E. Lawrence,** state maintenance engineer, Mass. Dept. of Public Works . . . **Thomas S. Cathers,** after 36 years as city engineer at Marion, Ohio . . . **R. R. Randall,** as city engineer of El Cerrito, Calif.

• **Honors—Stanley E. Sporseen,** attached to the Portland District, Corps of Engineers, named a member of the U. S. Committee on Large Dams of the World Power Conference . . . **Maj. Gen. M. J. Asensio,** who served as an engineer officer for the U. S. Army from his graduation from West Point (1927) to 1947, becomes vice commander of the Continental Air Command, U. S. Air Force.

• **Business—C. E. Hatch, A. H. Samborn, J. N. Steketee** form engineering firm of Hatch, Samborn, Stekete & Associates, in Toledo, Ohio . . . **Donald C. Jones** becomes treasurer and assistant secretary of Booth & Flinn, Pittsburgh constructors.

Precast concrete bridge members cost less!



Bridge, Glenlron, Pa.
Precasting by Concrete Products Co. of America, Phila., Pa.
Murphy Construction Co., Hummelstown, Pa., contractors
M. W. Loving, consulting engr., Glenview, Ill.

SONOVOID

FIBRE TUBES

for voids in concrete construction

SONOVOIDS up to 24.75" in diameter were used to form the hollows of each of the 45 pretensioned, prestressed, precast concrete members of this five span bridge.

Not only did the use of SONOVOIDS reduce the weight of each of the 53' members without impairing structural strength but they helped account for the 25% saving effected in construction costs.

Specifically developed for use in concrete bridge deck, wall, floor and roof slabs, SONOVOIDS save concrete and reinforcing steel.

SONOVOIDS are supplied in specified lengths or sawed to your requirements on the job. Sizes 2" to 36.9" O.D. up to 50' long.

See our catalog in Sweet's

For complete technical data and prices—write

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Power's no problem

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Wherever the going's tough, you find Le Roi engines. They power oilfield, construction, industrial, and farm machinery. Here's a typical construction-field application — powering a Littleford Bituminous Distributor.

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OBITUARIES

Glen G. Searing, 60, Jacksonville, Fla., contractor and head of Glen G. Searing Co., died June 24. Before locating in Florida in 1936, he was engaged in road construction in New York, New Jersey, Pennsylvania, Tennessee and Georgia.

Richard C. O'Keefe, 81, founder and a former executive vice-president of the General Contracting Employers Association of Buffalo, N. Y., died July 18. After his retirement the organization became the Construction Industry Employers Association.

Charles T. Fisher, former civil engineer for the U. S. Bureau of Roads, died July 26 in Albany, N. Y. A graduate of Worcester Polytechnic Institute, he served the Federal agency some 20 years before retirement last October.

Walter R. McCaffrey, 60, civil engineer and general manager of the Canadian Standards Assoc. since 1937, died July 10 in Ottawa. A graduate of the University of Toronto, he worked for the Toronto Brick Co. before joining the association.

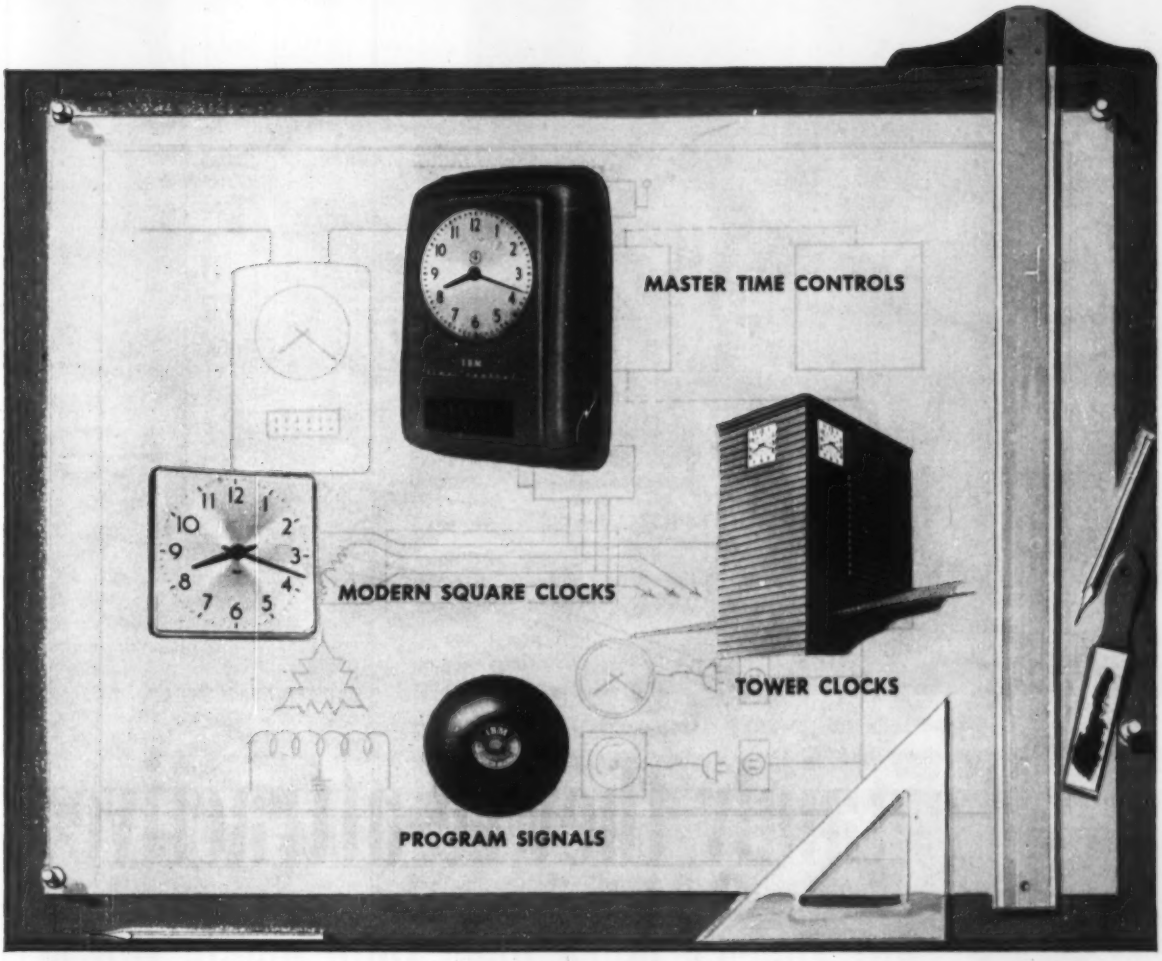
William B. Childers, 87, retired engineer of Worthington, O., died last month. He was construction superintendent of the Panama Canal's Gatum Locks and also founded and headed Childers Construction Co.

Edgar Reynolds, 55, Cumberland, Md., street commissioner from 1934-1944 and 1948-1950, was killed in an train-automobile accident July 26. At the time of his death he was general manager of the Cumberland Fair Association.

Francis L. Castleman, 79, retired chief engineer of the American Bridge Co. plants at Trenton, N. J., and Philadelphia, died at Storrs, Conn., July 18.

Harvey C. Rose, 60, Toronto roads commissioner, died July 24. A University of Toronto graduate, he joined the Ontario Department of Highways in 1920 and served as resident engineer at Guelph and London. Later he was named chief engineer of the Toronto and York Roads Commission and York County engineer.

Leon E. Ambrose, 62, a structural engineer on the staff of Stone & Webster Engineering Corp., Boston, died at Arlington, Mass., July 26 .



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LEGAL

Written orders for extra work

A contract provided that: "No statements for extras will be honored * * * unless these statements are in accordance with written orders signed by the general contractor and the subcontractor."

The court held that: "Such provision in a written contract does not prevent the parties from making separate parol [oral] agreements regarding extras. Continental Casualty Co. v. Schaefer, 9 Cir., 173 F. 2d 5, certiorari denied, 337 U.S. 940, 69 S. Ct. 1517, 93 L. Ed. 1745; Macri v. United States, 338 U.S. 829, 70 S. Ct. 63, 94 L. Ed. 497; Teer v. George A. Fuller Co., 4 Cir., 30 F. 2d 30; Bartlett v. Stanchfield, 148 Mass. 394, 19 N.E. 549; 2 L.R.A. 625. See also, Mazza v. Russel. 49 App. D. C. 87."[1]

This decision should be used with caution, as in some states, like New York, special statutes exist that provide that where a contract contains a provision to the effect that the contract cannot be changed except by an instrument in writing signed by the parties to be charged, there can be no oral modification of the contract.

(1) Shapiro, Inc. v. Bimlich et al., 101 A. 2d 890, Municipal Court of Appeals, District of Columbia, Jan. 7, 1953.

Time for performance

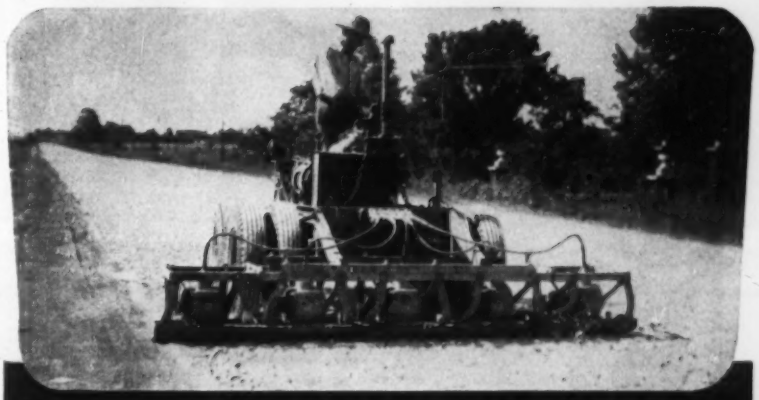
"It is so well settled as not to require the citation of authorities that where no time for performance is specified in a contract the law implies that it must be performed within a reasonable time."[1]

(1) Marion Trucking Co. v. Harwood Trucking Inc., 116 N.E. 2d 636, Appellate Court of Indiana, Jan. 14, 1954.

Construction of contracts

"It is settled beyond peradventure of doubt that the law will not make a better contract for the parties than they themselves have seen fit to enter into, or alter it for the benefit of one party to the detriment of another, nor supply a term with respect to which it is silent; the judicial function is to enforce a contract as it is written. Kupfersmith v. Delaware Ins. Co., 84 N.J.L. 271, 86 A. 399, 45 L.R.A., N.S. 847. The cardinal rule in the interpretation of contracts is to ascertain and effectuate the common intention of the parties and where parties have reduced their contract to writing, the intention that controls is that expressed or apparent in the writing. Corn Exchange,

(Continued on page 72)



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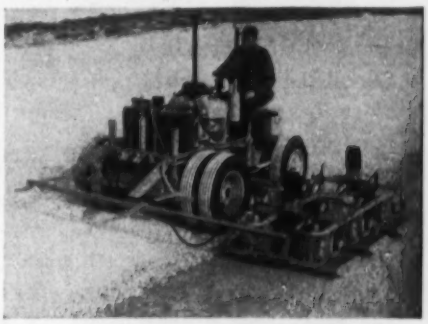
ON MACADAM CONSTRUCTION . . . only one pass or two usually required to compact 12" of rock to final density. And when sufficient fines are spread, one pass suffices to fill all voids. In GRAVEL SUB-BASES (blanket course) 7" thick, this machine has achieved 98% Standard Proctor in one pass. It is equally efficient in granular soil-cement paving or base course construction. Standard width is 13', 3". Working speeds: 0-60 F.P.M. Reverse travel speed: 5½ MPH.

COMPACTS WIDENING STRIPS IN ONE PASS . . .

IN ANY GRANULAR MATERIAL used in flexible base-course widening. For this purpose compacting units are assembled in tandem, (3 deep, single or double row) and towed at side of tractor. Compactor bases of 12" and up may be substituted for standard 26" bases to suit requirements.



SAND FILLS, SUCH AS BRIDGE APPROACHES . . . another spot in which this machine shines. It's rapid and gets into places inaccessible to larger equipment. For the really tight spots one or more of the compacting units may be fitted with operating handles and used as self-propelling, manually guided compactors.

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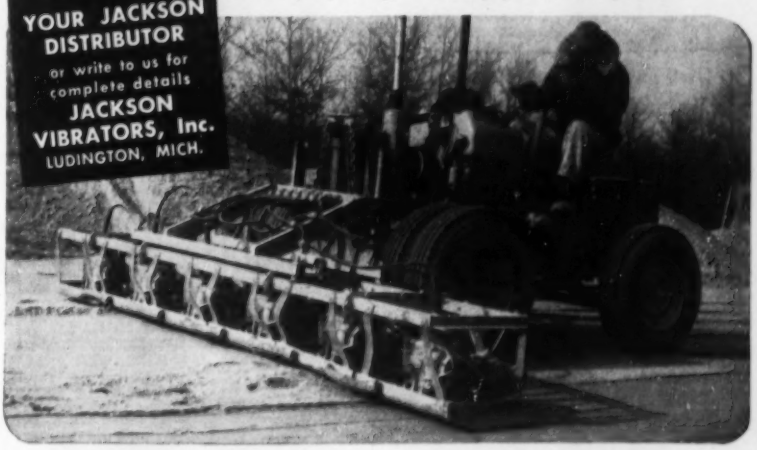

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Mounted on a rubber-tired tractor, the Sherman Power Digger makes a compact outfit that gets in and out of tight spots quickly and easily, moves from job to job at top tractor speeds.

It gets digging done in a fraction of the time and cost of manual labor. It digs as deep as 10′ below grade in mud, hardpan, gravel, shale or stony ground. Wide arc of swing allows ample reach for piling or loading. Instant fingertip control harnesses forces up to 10,000 pounds at shovel teeth.

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LEGAL

National Bank and Trust Co., Philadelphia v. Taubel, 113 N.J.L. 605, 175 A. 55."[1]

No part of a written contract should be rejected if it can be given a meaning. "A court is not authorized to construe a written contract in such a way as to modify the plain meaning of its words, under the guise of interpretation." The court cannot rewrite the contract, but must construe it in conformity with the written form to which the parties have attached their signatures.[2]

"The cardinal rule to be followed by the court in construing the meaning of a contract is to ascertain the intent of the parties as expressed in the language used in the contract and to give effect thereto. 12 American Jurisprudence, Contracts, Section 227."[3]

(1) Collingswood Hosiery Mills v. American Federation, 101 A. 2d 372.
(2) Best v. Realty Management Corp., 101 2d 438.
(3) Kennedy v. Westinghouse Electric Corp., 101 A. 2d 592.

Architect may not collect when agreed cost is topped

An architect was employed to prepare plans and specifications for a building. The contract was in writing and did not contain any provision as to upset cost of erecting the building.

The lowest bid received for the cost of erecting the building was $123,490. The owner told the architect that their agreement provided that the cost of the structure was not to exceed $100,000, and if it could not be erected for that price the deal was off. The building could not be erected within the claimed upset price, whereupon the project was abandoned. The architect then brought an action to recover for services rendered by him in preparing the plans and specifications. He denied that there had been any oral agreement fixing a limitation as to the cost of the building.

At the trial of the action the attorney for the architect objected to the admission of oral testimony on the part of the owner to the effect that at the time the written contract was entered into that there had been an oral agreement to the effect that the cost of erecting the structure would not exceed $100,000. The trial court held that such testimony was proper, and accepted the owner's version of the transaction rather than that of the architect. This judgment was affirmed by the appellate court,[1] which held that it was proper to admit testimony to the effect that there was an oral agreement that the cost of erecting the structure would not exceed $100,000.

(Continued on page 74)

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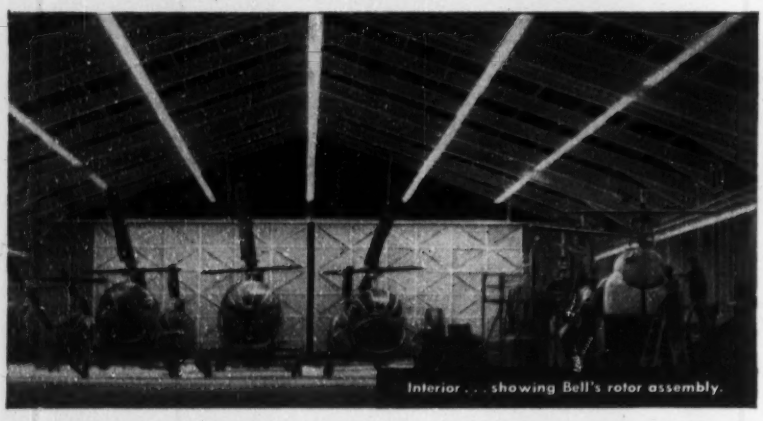

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LEGAL

The appellate court in its opinion pointed out that in the following cases it was held that where an architect furnished plans and specifications for a building in excess of the originally contemplated cost, that the owner would not be liable for the architect's fee. The cases referred to are: MacDonell v. Dreyfuss, 144 La. 891, 81 So. 383 and Andry & Feitel v. Ewing, Jr., 15 La. App. 272, 130, So. 570.

This case involved a question of fact as to whether or not there had been a separate agreement as to a fixed price of construction. As has been indicated, the court accepted the owner's version of the transaction and denied the architect any recovery.

(1) Rosenthal v. Gauthier, 69 So. 2d 367, Supreme Court of Louisiana, Dec. 14, 1953.

Rights of contractor under breached contract

A building contract gave the owner the right to abrogate the contract or complete it as the agent of the contractor in the event the contractor breached the contract. Upon the breach of the contract, the owner elected to completed the work as the agent of the contractor.

The contractor brought an action to recover the balance due under the contract. The court held that the contractor was entitled to recover the fair and reasonable value of the work done by him and for materials furnished up to the time of his discharge, provided that there is anything remaining out of the contract price after deducting therefrom the actual cost of completing the work according to the plans and specifications and deducting what the owner had already paid the contractor.[1]

(1) Kempa v. Moell et al., 126 N. Y. S. 2d 859, New York Supreme Court, Appellate Division, Jan. 6, 1954.

Cost-plus contracts

A contract was entered into whereby the contractor was to make certain repairs to a building. The contractor was to be paid on the basis of cost plus 20 percent. The fact that, at the time the contract was entered into, the owner did not realize the substantial nature of the repairs to be made or the cost thereof, and was unprepared to meet the large expenditures involved, did not relieve him of liability under the contract.[1]

(1) Ruff v. Vilevsky, 68 So. 2d 259, Court of Appeal of Louisiana, Nov. 3, 1953.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., North Andover**—PLANT—BA 8/10—Western Electric Co., 195 Broadway, New York, N. Y., (selected twist bidders), foundations only for 900,000 sq. ft. mfg. plant, Rte. 125. Total est. $10,000,000. Charles T. Main, Inc., 80 Federal St., Boston, engr. CD 7/22.

R. I., Middletown—SCHOOL—BA 8/17—Town, School Dpt., concrete masonry Oliphant Elementary School, RI 54-C-1, $300,000. Plans deposit $75 refundable. William M. O'Rourke, 90 Union St., Warren, archt. CD 6/16.

▲ **Mass., Hopkinton**—SCHOOL—BA 8/18—Town, School Bldg. Comn., J. A. O'Brien, chn., 30 Church St., Junior Senior High School. $1,380,000. Plans deposit $50, refundable. L. W. Briggs Assoc., Inc., 90 Park Ave., Worcester, archt. CD 12/23.

BUILDINGS

LOW BIDS AND CONTRACTS

Charles Logue Building Co., 71 Needham St., Newton Highlands, Mass. CA est. $775,000. CHURCH and youth center Elm St., MILLBURY, MASS. St. Bridgets R.C. Church, Most Rev. John J. Wright, DD, bishop, Chancery Office, 1 Tuckerman St., Worcester, Mass. Bids July 14. CD 7/6.

▲ **Ingalls Steel Products Co.**, 1 E. 42 St., New York, N. Y. CA total est. $10,000,000. steel fabrication, erection of mfg. PLANT Rte. 125, NORTH ANDOVER, MASS. Western Electric Co., 195 Broadway, New York, N. Y. Charles T. Main, Inc., 80 Federal St., Boston, Mass., engr. CD 7/22.

Joseph P. Flynn, 26 Custom House St., Providence, R. I. LB $448,618. est. $610,000. Junior HIGH SCHOOL, Soares Property, LINCOLN, R. I. Town, Vincent Nevins, Supt. Schools, Lonsdale, R. I. Bids July 28. CD 7/14.

Jack A. Halprin, Inc., 675 State St., New London, Conn. CA, $557,000, Susan Sheridan Junior High SCHOOL, 203-207 Fountain St., NEW HAVEN, CONN. City Bd. Educ., 169 Church St., New Haven, Conn. Bids July 16. CD 7/23, under LB.

▲ **Felix Buzzi & Son**, 612 S. Main St., Torrington, Conn., LB, $1,159,000, Proj. B/A-R-104, Windham Regional Technical SCHOOL, Upper Birch St. adjacent to Knight Field, WILLIMANTIC, CONN. State, Ralph G. Macy, P. Wks. Comr., State Office Bldg., Hartford, Conn. Bids July 28. CD 7/14.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲ **Pa., Bristol**—SCHOOL—BA 8/12—Bristol P. School Auth., Bristol, elementary school, athletic fields, $1,000,000. J. M. Blew & Son, 326 W. State St., Media, archts. George M. Ewing, Western Savings Bldg. Phila., assoc. archt. CD 3/17.

▲ **Pa., Chester**—SCHOOLS—BA 8/12—Chester School Dist., Ninth and Crosby Sts., Phila., Elementary School No. 2 in Highland Gardens Sect., $1,000,000; elementary school, 17 and Melrose Sts., $300,000, J. M. Blew & Sons, 326 W. State St., Phila., archts. CD 6/21.

▲ **Pa., Phila.**—MUSEUM—BA 8/12—Dpt. Procurement, City Hall Annex, modernization imprvs. commercial museum, Bids 4596-4597-4598, $1,680,000, Tholheimer & Weitz, 1325 Walnut St., archts. CD 8/5/53.

▲ **Pa., Phila.**—NURSES HOME—BA 8/12—Presbyterian Hospital, 51 N. 39 St., nurses' home, $1,100,000, Chatfield & Schlicher, 324 W. Chelten Ave., archts. A. Ernest D'Ambly, Architects Bldg., consult engr. Widdicombe Eng. Co., 117 S. 17 Ave., struct. engr. CD 2/4.

Del., Wilmington—SCHOOL—BA 8/18—Mt. Pleasant School District, Duncan Rd. and Phila. Pike, Carrcroft Elementary School, $950,000. George E. Pope & Albert Kruse, 1108 Washington St., archts. CD 11/30.

▲ **Md., Baltimore**—CATHEDRAL—BA 8/18—Diocese of Maryland, Chancery Office, 408 N. Charles St., cathedral. $7,000,000. Extended date. Maginnis & Walsh, 126 Newbury St., Boston, archts. CD 7/23.

▲ **N. J., Pennsville**—SCHOOL—BA About 9/1—Lower Penns Neck Bd. Educ., Pennsville, High School, $1,000,000. Micklewright & Mountford, 72 Ewing St., Trenton, archts. CD 1/21/53.

SOON LETS CONTRACT—BUILDINGS

▲ **N. J., Camden**—WAREHOUSE—Campbell Soup Co., 100 Market St., soon lets contract warehouse, $2,500,000. Carson & Carson, 16 S. Broad St., Phila., Pa., engrs.

N. J., Camden—COMMUNITY CENTER—Jewish Federation of Camden Co., 112 N. 7 St., soon lets contract community center, $500,000. Vincent G. Kling, 917 Corinthian Ave., Phila., Pa., archt. David Bloom & Julius Dorfman, 1411 Walnut St., Phila., Pa., engrs. CD 7/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Terry Contrg. Co., Inc.**, 31 E. 27 St., New York 16, N. Y., LB, $2,692,548, reconstr. Third Avenue Bridge over Harlem River between Manhattan and Bronx Boros. NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids July 28. CD 6/24.

▲ **NEW JERSEY-PENNSYLVANIA** — Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.

American Dredging Co., 12 S. 12 St., Phila., Pa., CA, $1,346,310, Contract P-1, grading, embankment, sewer load relieving structure for approaches in Phila., Pa. to new bridge between Packer Ave., Phila., Pa. and Gloucester, N. J. Bids July 15. CD 6/22.

▲ **McCloskey & Co.**, 1620 W. Thompson St., Phila., Pa. LB, $3,148,511. sedimentation basins and equip. at Torooresdale Filter Plant, PHILA., PA. Procurement Dpt., City Hall Annex, Phila., Pa. CD 7/16, under LB.

Square Constr. Co., 115 S. Haven St., Baltimore, Md. LB, $839,490. intercepting sewer 23 St., PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids July 20. CD 6/8.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore.

▲ **S. P. Brotemarkle Constr. Co.**, Box 393, Cumberland, Md. CA, $517,119. curbing, storm water sewers, rein.-con. paving of Frederick St. in Cumberland 1.429 mi., Cumberland, Contr. A 448-615, Allegany Co.:

T. B. Gatch & Sons, Inc., 5928 Belair Rd., Baltimore, Md. CA, $605,187. grading, wid'n., relocation surf. 5.465 mi. State Rte. 22, Aberdeen toward Churchville Rd., Contr. H 327-420, Harford Co. CD 6/23, under LB.

DELAWARE—State Hy. Dpt., Dover.

A. S. Wikstrom, Inc., Mottville, Skaneateles, N. Y., CA, $820,455, Walnut Street Extension, Sect. 3, Walnut St. Bridge Substructure, Contract 1224 (3), New Castle Co. Bids July 7. CD 7/14, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a suuplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Stone & Webster Engrg. Corp.**, 90 Broad St., New York 4, N. Y., CA $5,000,000, design and supervise constr. of building and supporting facilities for 25 billion electron volt PROTON SYNCHROTRON at Brookhaven Natl. Laboratory, BROOKHAVEN, N. Y. Atomic Energy Comn., 1901 Constitution Ave., N.W., Wash. 25, D. C. CD 1/13.

▲ **C. E. Youngdahl & Co. Inc.**, 29-28 41 Ave., Long Island City, N. Y., CA $10,268,000, general constr.;

H. Sand & Co. Inc., 11 Park Pl., New York 7, N. Y. CA $1,243,200, heating;

Martin Epstein Co., Inc., 227 Lewis Ave., Brooklyn 21, N. Y., CA $671,688, electrical work;

Far Plumbing Co., 2018 Crotona Parkway, New York 60, N. Y., CA $1,423,333, plumbing for Bay View HOUSES. Proj. No. NYC-24 bounded by Seaview Ave., E. 102 St., Shore and Rockaway Parkways, excluding northerly portion of area bounded generally by Seaview Ave., E. 99 and E. 98 Sts., Grand total $13,606,221. BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids July 13. CD 7/15 under LB.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y. LB $1,294,000. P. S. 26 SCHOOL, BROOKLYN, N. Y. Bureau Constr., 49 Flatbush Ave. Ext., Brooklyn 1, N. Y. Bids July 15. CD 6/16.

Chester Constr. Corp., 157 Atlantic Ave., Brooklyn 2, N. Y., CA $869,000, general constr., for modernization of existing Stuyvesant HIGH SCHOOL, 15 and 16 Sts., west of 1st Ave., Manhattan Boro, NEW YORK, N. Y. Dir. Bureau of Constr., 49 Flatbush Ave., Brooklyn 1, N. Y. Bids Apr. 20, awarded June 3. CD 5/6 under LB.

▲ **Maran Constr. Co.**, 1910 Arthur Ave., New York 57, N. Y. CA $1,011,000, P. S. 74 SCHOOL, electrical work and lighting fixtures for new addns. to and modernization of existing bldg., E. 189 St. between Crotona and Prospect Aves., Bronx Boro. NEW YORK, N. Y. Dir. Bureau Constr. 49 Flatbush Ave. Ext., Brooklyn 1, N. Y. Bids May 26. CD 5/11.

▲ **Met Contrg. Corp.**, 50 Court St., Brooklyn 2, N. Y. LB $1,048,000, Junior HIGH SCHOOL 127, Raymond Ave., between Purdy St., and Castle Hill Ave., Bronx Boro. NEW YORK, N. Y. Bureau of Constr., 49 Flatbush Ave. Ext. Brooklyn 1, N. Y. Bids July 13. CD 6/16.

▲ **H. B. Alexander & Son**, 315 Vaughn St., Harrisburg, Pa., CA $1,000,000. TEMPLE for the Scottish Rite Consistery, Masonic Order, Third and Wiscinsco Sts., HARRISBURG, PA. Masonic Temple, 3 and State Sts., Harrisburg, Pa. Bids July 27, awarded July 28. CD 7/26.

▲ **Crumwald Building Co.**, Att. W. A. Raynor, 1518 Walnut St., Phila., Pa. Separate Contracts. $1,500,000. RESIDENTIAL DEVELOPMENT, Milmont Ave. and Frances Way, MILMONT, PA. Erling Wenge, McClatchy Bldg., Upper Darby, Pa., archt.

John Wickersham, Inc., 145 Locust St., Lancaster, Pa. LB $587,500. JUNIOR SENIOR HIGH SCHOOL, PARADISE, PA. Pequia Valley School Auth., Paradise, Pa. Buchart Engineering Corp., 611 S. Market St., York, Pa., archts. Bids July 23.

▲ **Lened Homes, Inc.**, 7201 Brous Ave., Phila., Pa. Separate Contracts. $1,200,000. RESIDENTIAL DEVELOPMENT, Bradford Ave., PHILA., PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Gowan Williams Corp., 8501 Temple Rd., Phila., Pa. Separate Contracts. $720,000. RESIDENTIAL DEVELOPMENT, Mount Airy Ave., PHILA., PA.

Stalar Building Co., Inc., 529 Brookhurst Ave., Narberth, Pa. Separate Contracts. $775,000. RESIDENTIAL DEVELOPMENT, Wynnewood Ave., WYNNEWOOD, PA. Edward Geddes, 844 Montgomery Ave., Narberth, Pa., archt.

Devonshire Homes, Inc., 316 Wildel Ave., Minquadale, Wilmington, Del., Separate Contracts. $310,000, RESIDENTIAL DEVELOPMENT, Devonshire Rd., WILMINGTON, DEL.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **WEST VIRGINIA**—State Road Comn., Charleston,

Osborne Constr. Co., P.O. Box 2108, Clarksburg, W. Va., LB, $413,742, 9.933 mi. W. Va. 2, Fed. Aid Proj. F 184 (9 & 10), Marshall and Wetzel Counties;

Acme Constr. Co., Beckely, W. Va., LB, $879,811, 2.025 mi. U.S. 52, Fed. Aid Proj. F-190, McDowell Co. Bids July 27. CD 7/21.

† **Leifert Constr. Co., Inc.**, 2401 N.W. 2 Ave., Miami, Fla., CA, $754,900, underwater ordnance test bldg., U. S. Naval Station, NOY 81227, KEY WEST, FLA. Dpt. Navy, P. Wks. Officer, Naval Base, S. C. CD 7/9, under LB.

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RIB DEPTHS: 1½", 1¾", 2", 2½", 6" on centers.

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▲ Sullivan, Long & Hagerty, 2028 2 Ave. North, Bessemer, Ala., CA, $1,156,086, Third Phase, Ensley Sewer Treatment Plant, BIRMINGHAM, ALA. Jefferson Co., Court House, Birmingham, Ala. Bids July 20, awarded July 27. CD 7/6.

▲ Ray Ryan, 800 E. Michigan St., Evansville, Ind. LB, $1,058,618. Contr. 5, 7.2 m.g.d. primary type sewage treatment plant and river pumping station; Contr. 6, Ohio River interceptor consisting of pumping station together with approx. 1,600 lin. ft. 6 in. c.i. pipe force main, more than 1 mi. 8 to 15 in. gravity sewers, approx. 4,000 ft. 24 in. c.i. force main, approx. 2 mi. 30 to 36 in. gravity sewers, HENDERSON, KY. City, City Hall, Henderson, Ky. Bids July 29. CD 6/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Caldwell & McCann, Box 477, Baton Rouge, La. CA $694,179. brick, steel Glen Oaks Elementary and Junior High SCHOOL, BATON ROUGE, LA. East Baton Rouge Parish School Bd., Baton Rouge, La. Bids July 13, awarded July 19. CD 7/20, under LB.

Wood Constr. Co., Box 225, Quitman, Miss. LB, $767,000. 1 story, 75,000 sq. ft. Prescott Junior High SCHOOL, Prescott Rd., BATON ROUGE, LA. East Baton Rouge Parish, Baton Rouge, La. Bids July 27. CD 7/7.

Caldwell & McCann, Box 477, Baton Rouge, La. CA, $532,500. 1 story, brick, steel, masonry HOSPITAL, MORGAN CITY, LA. Bd. Comm. Hospital Service Dist. No. 2, Morgan City, La. Bids June 15, awarded July 19. CD 6/22.

J. A. Jones Constr. Co., Box 1818, Shreveport, La. LB, $708,700. 4 story, masonry department STORE, site of old Majestic Theater, SHREVEPORT, LA. Selber Bros., 429 Milam St., Shreveport, La. Bids July 27. CD 7/22.

▲ Ebasco Services, Inc., 2 Rector St., New York 6, N. Y. CA Est. $15,000,000. design and construct oil REFINERY, PORT EVERGLADES, FLA. Miami Oil & Refining Co., Boca Raton, Fla.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

Ill., Chicago—BA 8/19—City, City Hall, bridge over North West Expressway, on Monroe St. $600,000. CD 4/4/45.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ OHIO—State Hy. Dpt., Columbus,
Fischer Constr. Co., 4053 Clifton Ave., Cincinnati, O., CA $2,092,125. est. $2,454,800, Type T-35 and T-71 and structures, USR 23, Sects (0.00-5.37), 17.66, F-460 (5), F-306 (5), Harrison Twp. and Village of South Bloomfield and Hamilton Twp., Franklin and Pickaway Counties;
Shelly & Sands, Inc., Thornville, O., CA $507,649, est. $574,700, Type T-35 and structures USR 40, Sects. 24.90, (0.00 6.13), Truro Twp. and Etna Twp., Franklin and Licking Counties. Bids July 20. CD 7/28 under LB.

The American Constr. Co., 4100 Brookpark Rd., Cleveland, O., CA $720,641. est. $880,500, grade, drain, pave Alexander Rd. in Walton Hills and Oakwood from Northfield Rd. to Broadway and grade separation at Pennsylvania R.R. to connect with Pettibone Rd., CLEVELAND, O. Cuyahoga Co. Bd. Comrs., 135 Court House, Cleveland 14, O. Bids July 29, awarded July 29. CD 7/2.

▲ INDIANA—State Hy. Comm., Indianapolis,
Wm. D. Vogel Constr. Co., 3760 E. St. Clair St., Indianapolis, Ind., LB, $601,602, est. $765,829, conc. base wid'n., b. conc. resurf., c. conc. 4.216 mi. State Rd. 67, Hendricks and Marion Counties; LB $467,355, est. $559,568, c. conc. 4.149 mi. State Rd. 32, Hamilton Co.; LB $720,801, est. $846,913, c. conc. 6.521 mi. State Rd. 59, Clay Co.;

Berns Constr. Co., 312 E. Washington St., Indianapolis 4, Ind., LB, $801,743, est. $961,749, c. conc. 3.16 mi. U. S. Rd. 41, Rural District, Sullivan and Vigo Counties; LB $611,108, est. $713,923, c. conc. 2.732 mi. U. S. Rd. 52, Benton Co. Bids July 27. CD 7/7.

▲† T. L. James, Ruston, La., and W. R. Aldreich Constr. Co., Alexandria, La., CA, $6,976,343, runway paving, etc., at Bunker Hill Air Force Base, PERU, IND. Ninth Naval District, Naval Training Center, Great Lakes, Ill. CD 1/7/53.

ILLINOIS—State Div. Hys., Springfield,
Zimmerly Constr. Co., Marshall St., Paris, Ill., CA, $865,270, c. conc. base course 3.22 mi., c. conc. base course wid'n. 7.46 mi., c. conc. 1.51 mi. U. S. 150, Vermilion and Edgar Counties;
Orr Constr. Co., 27 E. 19 Pl., Chicago Heights, Ill., CA, $699,950, c. conc. 0.55 mi., bit. resurf. 0.28 mi., c. conc. base course 3.51 mi., c. conc. base course wid'n. 8.56 mi. and 1 bridge, Ill. No. 2, Kankakee Co. Bids July 16, awarded July 27. CD 7/22, under LB.

▲ MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
S. J. Groves, Wesley Temple Bldg., Minneapolis, Minn. CA $919,984 est. $960,000. grading, dual roadways Detroit-Toledo Expressway, FI 58-57 C7-U, (UI 424 4), FI 58-57 C8-R (FI 424 4), Monroe Co.;
Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. CA $1,218,400. est. $1,340,000. grading, structures, two 40 ft. roadways Detroit-Toledo Expressway, I 58-57 C5-R (I 424 6), Monroe Co. CD 7/22 under LB.

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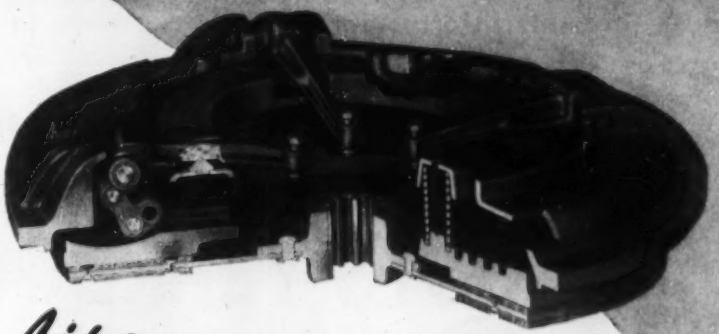

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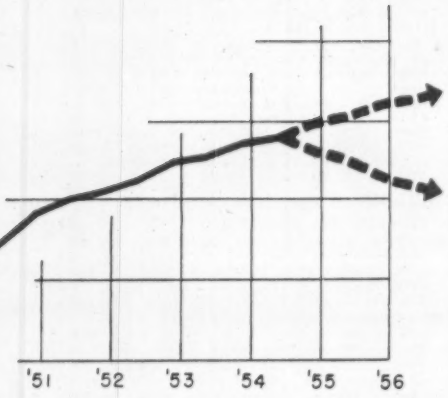
Which way are costs going?



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▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing, Mich.
L. A. Davidson Co., 213 E. St. Joseph St., Lansing, Mich. CA $1,238,328. est. $1,300,000. rein.-con., steel bridge over US-12 and relocation of US-23, F B1 of 81-1-13 C1-R (F 405 2), Washtenaw Co. CD 7/22 under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Darin & Armstrong, Inc., 2041 Fenkell St., Detroit 23, Mich. LB $3,386,000. est. $3,500,000. rein.-con., steel level bridge Eight Mile Rd. and Woodward utilities, pump house, temporary road constr., bldg. demolition, F B4 of 63-19-10 C1-U (F 258 19), Wayne Co.;
Walter Toebe Co., 412 W. Gier St., Lansing, Mich. LB $1,477,681. est. $1,580,000. rein.-con., steel bridge and 200 ft. rein.-con. retaining wall on Detroit-Toledo Expressway over River Raisin and N. Y. C. R.R., UI BS of 58-7-26 C1 (UI 424 2), Monroe Co.;
Raff & Dexter, 210 W. Greenlawn Ave., Lansing, Mich. LB $81,292. est. $90,000. rein.-con., steel bridge on Detroit-Toledo Expressway over Plum Creek FI B1 of 58-12-26 C1 (FI 424 9), Monroe Co.;
C. A. Hull, Dryden, Mich. LB $283,774. est. $300,000. rein.-con., steel grade separation bridge N.Y.C. R.R., UI X3 of 58-7-26 C1-U (UI 424 1), Monroe Co. Bids July 28. CD 7/15.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Grant-Holladay Constr. Co.**, Calahan Bldg., Dayton, O., Owner Builds. $1,000,000. 2 story, 40,000 sq. ft. SHOPPING CENTER, KETTERING, O.
Paugh & Brown, Inc., 6007 Euclid Ave., Cleveland, O. CA $750,000, 3-story bsmnt. 230-student DORMITORY, UNIVERSITY HEIGHTS, O. John Carroll University, Heights, O. Bids July 14. CD 6/28.
A. L. Jackson Co., 161 E. Erie St., Chicago 11, Ill., CA, $969,965, 8 story PARKING GARAGE, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids June 17, awarded July 26. CD 6/22, under LB.
† **Corbetta Constr. Co., Inc.**, 208 S. La Salle St., Chicago 4, Ill., CA, $580,000, Naval and Marine Corps. Reserve TRAINING CENTER, FOREST PARK, ILL. Ninth Naval Dist., Great Lakes Naval Training Station, Great Lakes, Ill. Bids July 2, awarded July 24. CD 7/29, under LB.
Norman T. Hobson, 18009 Western Ave., Harvey, Ill., CA, $325,258, South West Elementary SCHOOL;
Otto A. Schulz, 3114 Harrison St., Evanton, Ill., CA, $992,156, North West, South East and North East Schools, HARVEY, ILL. School District 152, 15148 Loomis St., Harvey, Ill. Bids June 29, awarded July 26. CD 7/12, under LB.
▲ **Federici Constr. Co.**, 6216 S. Oakley St., Chicago, Ill. Own Forces. $1,300,000, 100 HOMES, in area of WORTH, ILL.
Benjamin & Stephens, Inc., 259 S. Woodward St., Birmingham, Mich. Owner Builds. est. $800,000. 43 single brick HOMES, Glencoe Estates, Burnham and Blanford Rds. and Blanford Court, BLOOMFIELD, MICH.
John C. Westphal, Inc., 12274 Coyle St., Detroit 27, Mich. CA $570,000. est. $600,000. Contr. PO-13. 2 story, bsmnt., brick, concrete, steel police STATION 16 Precinct, DETROIT, MICH. City, Edward S. Piggins, police Comr., 1300 Beaubien St., Detroit, Mich. Bids July 13. CD 6/25.
Barlum Homes Builders, Inc., 1430 Meadow Lane, Detroit, Mich. CA est. $600,000. 55 brick ranch HOUSES Middle Rouge Park development, Middlebelt and Cherry Hill Rds., DETROIT, MICH. Rose-Hill Realty Co., 17300 Grand River St., Detroit, Mich.
▲ **Granger Brothers**, 2702 S. Cedar St., Lansing, Mich. CA $1,548,400. general contract;
Mario Branz Co., Lansing, Mich. CA $365,000, mechanical contract;
Lansing Electric Motors, 1905 S. Washington St., Lansing, Mich. CA $91,900. electrical contract; Junior High SCHOOL, LANSING, MICH. City, Teresa V. Darling, secy., Bd. Educ., 419 N. Capitol St., Lansing, Mich. CD 7/23 under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Okla., Oklahoma City**—AIRFIELD IMPRVS.—BA 8/19—U. S. Eng., Box 61, Tulsa, Zone 2, airfield imprvs. Tinker Air Force Base, ENG-34-066-55-5. $3,000,000. Corrected bid date. CD 7/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Dallas Power & Light Co., Dallas Power & Light Bldg., Dallas, Tex. Own Forces, $75,000 imprv. street lighting sys. in an area; $535,000, imprv., exten. overhead electric distr. lines, DALLAS, TEX. CD 7/19.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bond Constr. Co.**, Midland Bank Bldg., Minneapolis, Minn. CA Est. $2,000,000. general contract SHOPPING CENTER incl. 3 bldgs., 25 stores with total of 155,000 sq. ft. CRYSTAL, MINN. Willow Bend Co., O. P. Jones, secy., Midland Bank Bldg., Minneapolis, Minn. CD 8/4/53.
▲ **Shelby Constr. Co.**, 1108 Canal St., New Orleans, La. CA Est. $8,000,000. 15 to 20 story OFFICE, KANSAS CITY, MO. Mosely Tower, c/o Mosely & Co., Insurance Exchange Bldg., Kansas City, Mo. H. T. Fisher & Assoc., 322 W. Washington St., Chicago, Ill., and Emery Roth & Sons, 575 Madison Ave., New York, N. Y., archts.

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As average pile pier has only 3 piles, every pile must be perfect

454 big piles driven open end to bedrock

Project: Foundation for Colgate-Palmolive Co. industrial service bldg., Jersey City, N. J.

General contractor: George A. Fuller Corp.

Architects & Engineers: Albert Kahn Associated

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HEAVY DUTY AUTOMATIC DRAGLINE BUCKETS

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Centex Constr. Co., 4911 Greenville St., Dallas, Tex., Own Forces. $382,000, 36 frame type DWELLINGS; $368,500, 33 frame DWELLINGS in Section 1, DALLAS, TEX. CD 6/23.

Centex Constr. Co., 4911 Greenville St., Dallas, Tex., Owner Builds. $345,000, 30 frame DWELLINGS, concrete slab fdn.; $359,165, 31 frame type dwellings, exten. of Country Club Park Addn., DALLAS, TEX. CD 6/23.

R H A Corp., 813 Boyce St., Fort Worth, Tex., Owner Builds, $330,000, 30 addnl. DWELLINGS, FORT WORTH, TEX. CD 7/1.

Home Owned Properties, Inc., 1306 Texas St., Houston, Tex. Owner Builds. $310,000 (A), 27 frame type DWELLINGS; $375,000 (B), 37 frame, asb. siding, DWELLINGS. $325,000 (C), 30 frame, masonry trim DWELLINGS, Area No. 2, HOUSTON, TEX. Grand total $1,010,000. CD 6/26.

Huntleigh Corp., 11257 Memorial Dr., Houston, Tex. Owner Builds. $315,000. seven masonry DWELLINGS $378,000, eleven 2 story masonry DWELLINGS, 2½ mi. west of Post Oak Rd., HOUSTON, TEX. CD 7/21.

N. R. Wall Realty Co., 1704 Bissonnet St., Houston, Tex., Owner Builds, $335,000, 10 solid masonry DWELLINGS, concrete pier and beam fdn.; $375,000, 12 masonry DWELLINGS, HOUSTON, TEX. CD 7/19.

Twenty One Realty Co., c/o D. E. Carter, pres., c/o Deutser Bros., Shell Bldg., Houston, Tex., Own Forces. $327,100, 34 frame DWELLINGS, concrete slab fdn.; $300,000, 30 frame dwellings, concrete slab fdn., HOUSTON, TEX. CD 6/25.

Alfred C. Poage, 7140 Orville St., Houston, Tex., Owner Builds, $365,000, 36 DWELLINGS; $344,500 31 DWELLINGS, PASADENA, TEX. CD 7/6.

W. H. Barnes & Co., 1418 W. Hildebrand St., San Antonio, Tex., CA, $367,815, 24 brick veneer DWELLINGS, concrete slab fdn.; CA, $370,500, 18 brick, stone dwellings, concrete slab fdn., SAN ANTONIO, TEX. W. H. Barnes Real Estate Co., 1418 W. Hildebrand Ave., San Antonio, Tex. CD 6/24.

E. J. Burke & Sons, Inc., 1100 Goliad Rd., San Antonio, Tex., Own Forces. $338,000, Sect. 1, 45 frame DWELLINGS, cedar post fdn.; $312,500, Sect. 2, 31 frame DWELLINGS, concrete fdn., SAN ANTONIO, TEX. CD 7/16.

Centex Constr. Co., Box 4637, Dallas, Tex., CA $349,990, 39 frame DWELLINGS; CA $312,119, 30 frame DWELLINGS, concrete slab fdn.; CA $325,175, 35 DWELLINGS, SAN ANTONIO, TEX. Grand total $987,284, Bexar County Development Co., 343 Storywood St., San Antonio, Tex. CD 7/21.

Hollywood Park Development Co., San Pedro Ave., San Antonio, Tex., Owner Builds. $312,450, 26 frame DWELLINGS, concrete slab fdn.; $318,000, 30 frame dwellings, masonry trim; $349,500, 34 frame dwellings, concrete slab fdn. Grand total $979,950, SAN ANTONIO, TEX. CD 7/1.

Northside Building Materials Co., 3400 Fredericksburg Rd., San Antonio, Tex. Owner Builds, $310,000, 30 frame DWELLINGS: $335,000, 34 frame, asb. siding DWELLINGS, concrete slab, SAN ANTONIO, TEX. CD 7/2.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Ore., Portland**—SERVICE CENTER—BA About 9/1 —Portland General Electric Co., 621 S. W. Alder St., (sealed list of bidders) service center. $1,100,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Morrison-Knudsen Co.**, 319 Broadway, Boise, Idaho, CA, $1,168,977, earthwork, concrete lining, structures, Unit 2, Wellton Distribution Sys., Gila Proj. Spec. DC 4188, ARIZONA, Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids July 13, awarded July 29. CD 7/26, under LB.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

A. Teichert & Son, Inc., 1931 Stockton Blvd., Sacramento, Calif., CA, $652,265, grading, surf. 4.9 mi. El Dorado Co. Bids June 30. CD 7/16, under LB.

McGuire & Hester, 796 66 Ave., Oakland, Calif., LB, $99,970, sewage treatment plant, Phase No. 1, LB, $174,475, outfall and interceptor sewers, MARTINEZ, CALIF. City, City Hall, Martinez, Calif. Bids July 16. CD 6/23.

† **Griffith Co.**, 1060 S. Broadway, Los Angeles, Calif., LB, $210,600, seaplane parking area, U. S. Naval Air Station, North Island, NOY 85142, Spec. 44717, SAN DIEGO, CALIF. Eleventh Naval Dist., Dpt. Navy, San Diego, Calif. Bids July 20. CD 7/2.

Pipe Linings, Inc., 4675 Firestone Blvd., South Gate, Calif., LB, $323,907, relining San Joaquin Pipeline No. 1, Cashman Creek Valve House to Coffee Rd., portion of Hetch Hetchy Aqueduct, SAN FRANCISCO, CALIF. P. Utility Comn., City Hall, San Francisco, Calif. CD 2/5/45.

† **Pacific Coast Builders**, 2530 18 St., San Francisco, Calif., LB, $125,337, PX and Cafeteria Bldg., ENG-04-167-54-29, Spec. 1680, TRAVIS AIR FORCE BASE, CALIF. U. S. Eng., Wright St., Sacramento, Calif.

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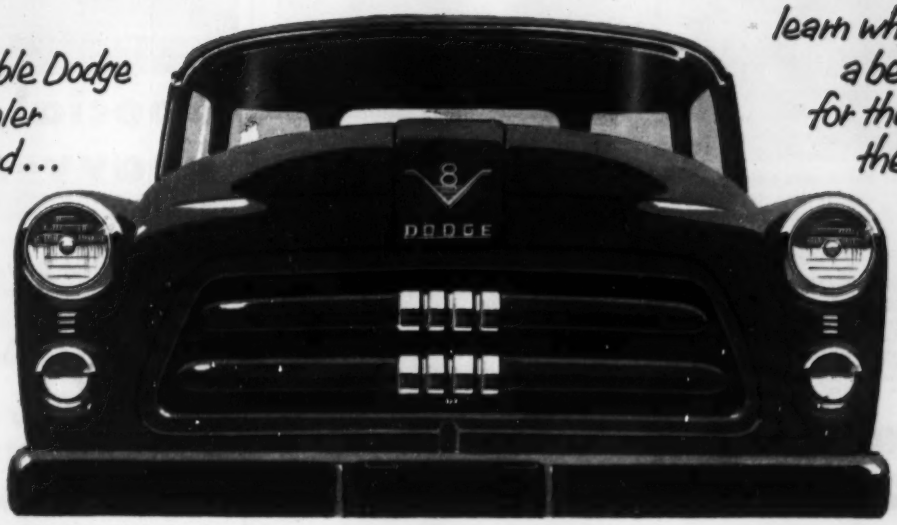

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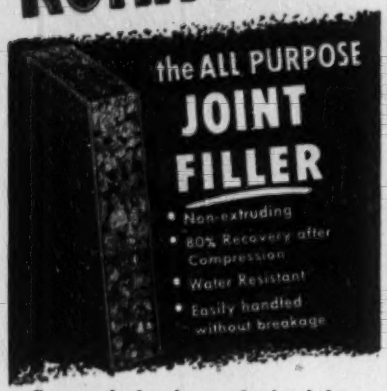

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BUILDINGS

LOW BIDS AND CONTRACTS

▲ **J. H. Pomeroy & Co., Inc.**, 333 Mongomery St., San Francisco, Calif., CA, $2,500,000. 3 story, 340,000 sq. ft., rein.-con. FACTORY Addn., SAN FRANCISCO, CALIF., American Can Co., 111 Sutter St., San Francisco, Calif. Bids Dec. 14. CD 12/11.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Bechtel-Mannix-Hester** (Canadian Bechtel, Ltd., 25 King St. W., Toronto, Ont., Mannix, Ltd., Calgary, Alta. and Oklahoma Contg. Co., T. A. Hester, pres., Mercantile Bank Bldg., Dallas, Tex.), 25 King St. W., Toronto, Ont. CA Est. $250,000,000. design and construct 2,200 mi. natural gas line from Alberta to Montreal, Que., ALBERTA and QUEBEC. Trans-Canada Pipe Lines, Ltd., N. E. Tanner, pres., Calgary, Alta. CD 5/3/51.

▲ **ONTARIO**—Dpt. of Hys., Parliament Bldgs., Toronto, **Eric Reilly Constr. Ltd.**, 23 Connie St., Weston, Ont., CA, $520,780, grading, culverts, gran. base, on section of Trans-Canada Hy. in Kenora Area;

K. J. Beamish Constr. Co. Ltd., 2460 Dufferin St., Toronto, Ont., CA, $80,510, resurf. hot mix. patching Hy. 60 from Huntsville to Dwight, Awarded July 28. CD 4/27/44.

James Kent Constr. Co., Ltd., 121 Vanstmark St., Hamilton, Ont. CA, $290,000, 7,600 lin. ft. 6 and 8 in. c.i. water mains, BURLINGTON, ONT. Municipality, Burlington, Ont. E. R. Swift, Town Hall, Burlington, Ont., town engr. Bids July 12.

Fullerton Constr. Co., Sandwich St., Windsor, Ont., CA, $65,398, 30 in. water mains, SARNIA, ONT. City Council, City Hall, Sarnia, Ont. D. Silliman, City Hall, Sarnia, Ont., city engr. Bids July 5, awarded July 28. CD 6/23.

Simar & Freres Cie Ltee., 3033 Cote St. Michel Rd., Montreal, Que., LB, $882,783, buildings, truck scales, at Royalmount Ave. Incinerator, MONTREAL, QUE. City, C. E. Longpre, clk., Montreal, Que.

BUILDINGS

LOW BIDS AND CONTRACTS

Fluor Corp. of Canada Ltd., 200 Bloor St. E., Toronto, Ont., CA, $725,000, OIL REFINERY exten., 9 Ave. E., CALGARY, ALTA. British American Oil Co. Ltd., Bay and College Sts., Toronto, Ont. Awarded July 26. CD 5/9/46.

Karen Constr. Co. Ltd., 133 Broadway Ave., Toronto, Ont. Owner Builds. $392,000. 52-suite, 3 story, bsmnt., 55x221 ft., concrete block, brick APARTMENT, TORONTO, ONT. Rad M. Radovich, 133 Broadway Ave., engr.

▲ **B. Gendron**, 2233 Blvd. Royal, Shawinigan Falls, Que., CA, $1,500,000, 210 concrete, brick DWELLINGS, SHAWINIGAN SOUTH, QUE. La Cite Modele, 221 St. Maurice St., Shawinigan Falls, Que.

LATIN AMERICA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ † **Frederick Snare Corp.**, 233 Broadway, New York, N. Y. and **Merritt-Chapman & Scott Corp.**, 260 Madison Ave., New York, N. Y. CA est. total $43,000,000. nickel PLANT addn. for the General Services Admin., NICARO, CUBA. National Lead Co., 111 Broadway, New York 6, N. Y. CD 4/14.

Proposed Projects

WATER SUPPLY

Kan., El Dorado—City, water line from El Dorado to Arkansas River. $338,000.

N. C., Raleigh—City, City Hall, voted $800,000 bonds July 24, imprv. city water supply sys. CD 6/30.

O., Westerville—Village, Ralph W. Snyder, city mgr., WW imprvs., water mains in Broad St., E. Broadway, E. College Ave., E. Home St., $27,276; replace 4 in. mains in Vine St. with larger mains, connect with east-west lines, $17,018; install 200,000 gal. storage tank, in southeast area $57,160; belt transmission water sys. around southern and eastern limits of village, $45,300.

Okla., Alva—City, 20 mi. 18 in. water supply line. $600,000. R. D. Alexander, Terminal Bldg., Oklahoma City, consult. engr.

Okla., Barnsdale—City, reservoir water supply. $150,000. H. T. Lawrence, 1802 N.W. 21 St., Oklahoma City, consult. engr.

Okla., Midwest City—City, defeated $112,000 bonds July 20, 6 addnl. water wells. J. M. Plank, 1323 N. Robinson St., Oklahoma City, consult. engr. CD 6/21.

▲ **Okla., Ponca City**—City, drilled well water supply, $1,000,000, R. D. Afexander, Terminal Bldg., Oklahoma City, consult. engr. CD 12/7.

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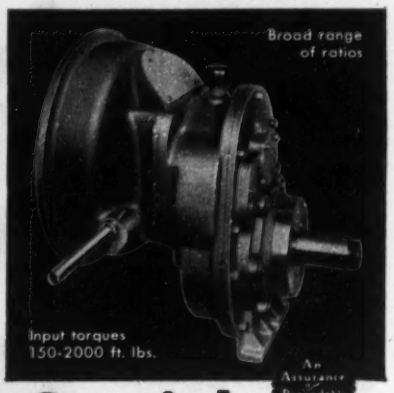

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Tex., Merkel—City, laying large main to tie into Abilene, Tex. water sys. $300,000; water pumping unit, $75,000.

Tex., Thorndale—City, WW sys. imprvs. $100,000. The Marvin Turner Engineers, 305 W. 11 St., Austin, consult. engrs. CD 5/19.

SEWERS, WASTE DISPOSAL

▲ Conn., Norwich—City, Richard F. Marks, mayor, City Hall, sewage disposal plant. $1,830,000. CD 3/26/47.

Kan., Topeka—City, sewage plant expansion, $750,000, Servis, Van Doren & Hazard, Crawford Bldg., Topeka, consult. engrs. CD 6/16.

▲ Miss., Columbus—City, voted $1,600,000 bonds sanitary sewer imprvs., $1,300,000; WW., $300,000. CD 5/26.

N. Y., Mineola—Bd. Supervs. Nassau Co., Old County Court House, Franklin Ave., Longacre Avenue Sewage Pumping Station, Woodmere, $184,000. CD 9/19/51.

▲ N. C., Raleigh—City, City Hall, voted $2,000,000 bonds July 24, imprv. sanitary sewage sys. CD 6/30.

O., Fairview Park—City, 20785 Lorain Rd., trunk sewer in W. 210 St. from Abbington Rd. to S. Park Dr. $565,000, John R. Cloyd, c/o owner, engr.

O., Salem—City, $450,000 bond election Nov. 2, sewage plant enlargement. CD 6/9.

O., Toledo—Comrs. Lucas Co., Court House, enclose Silver Creek as storm sewer from Alexis Rd. to Whitmer Dr. $163,650. Guy E. Neeper, co. engr. CD 11/2/44.

O., Youngstown—City, Mayor Frank X. Kryzan, rebuild Gibson Run Sewer, $250,000; construct control and overflow chambers on Mill Creek Sewer, $50,000. James C. Ryan, city engr. CD 10/31/46.

Okla., Midwest City—City, defeated $673,000 bonds July 20, sewage disposal plant. J. M. Plank, 1323 N. Robinson St., Oklahoma City, consult. engr. CD 6/21.

Tenn., Whitehaven—John B. Goodwin Commerce Title Bldg., Memphis, sewerage sys. for residential commercial development. $100,000.

▲ Tex., Abilene—City, C. E. Gatlin, mayor, sanitary sewerage sys. rehabilitation, $250,000; sewage disposal plant, $275,000; sewage lift station, $90,000; sanitary sewer collection lines, $1,135,000. CD 11/10.

Tex., Bellaire—Meyerland Co., c/o Thomas A. Robinson, Jr., 510 Taft St., Houston, storm sewers, $67,500; sanitary sewer collection lines, $70,000. Hilson & Coulson, 3821 Fannin St., Houston, consult. engrs.

Tex., Dallas—Mayflower Investment Co., c/o Carr P. Collins, 912 Commerce St., sanitary sewer, $65,000; storm sewer, open drainage, $65,000, in an area of Plymouth Park Community.

Tex., Houston—Ethelyn Corp., c/o Malcolm McCulloch, 2111 Jensen Dr., McCulloch Lumber Market, sanitary sewer, $75,000; storm sewers, $89,000, adjacent to Willow Bend. J. B. Dannenbaum, 3940 Main St., consult. engr.

Tex., Houston—Wm. G. Farrington & Co., 1661 Tanglewood Houston, sanitary sewers $65,000; storm sewers, $65,000 second sect. of Tanglewood subdivision, Swank Project.

Tex., Pasadena—Marvin Henry Builders, Inc., 2002 Chippendale St., Houston, sanitary sewers, $67,500; storm sewers $65,000, second section of 248-acre off Red Bluff Rd., Tanglebriar Subdivision.

Tex., Pasadena—Parker Brothers & Co., Inc., 5303 Navigation Blvd., Houston, sanitary sewer collection lines, $65,000; sewage disposal plant, $75,000; storm sewers, $64,450, 1 mile beyond South Ave., outside city limits.

Tex., San Antonio—Bellaire Lumber Co., 7903 S. Flores St., Second Section, sanitary sewers, $60,000; storm sewers-open drainage, $62,500, off Military Hy. and Pleasanton Rd.

Tex., San Antonio—Northwest Subdivision, Inc., Babcock Rd., sanitary sewers, $60,000; storm sewers $60,000 on tract bounded by Babcock and Hillcrest Rds.

Tex., San Antonio—Ray Ellison Properties, Inc., 1650 W. Mulberry St., sanitary sewers, $65,000; storm sewers, $60,000, for area Westridge Park, U.S. Hy. 90 West and Acme Road.

Wash., Mount Vernon—City, City Hall, sewer exten. $200,000.

▲ Ont., Oakville—Town, C. H. Byers, clk., sewage plant exten. to service southern areas of Trafalgar Twp. $1,000,000. Dinneen, Philips & Roberts, 63 John St., Hamilton, consult. engrs.

BRIDGES

Kan., Wichita—City, bridge over Big Arkansas River, $100,000, R. S. Delamater, Derby Bldg., consult. engr.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Framingham—railroad crossing elimination, $100,000, Charles T. Main, Inc., 80 Federal St., Boston, consult. engr.

O., Cleveland—Comrs. Cuyahoga Co., 135 Court House, Zone 14, sealing lower streetcar level of Detroit-Superior Bridge and fill, paving of entrance, $131,000. Osborn Eng. Co., 7016 Euclid Ave., Zone 3, consult. engr. A. S. Porter, Standard Bldg., Zone 14, co. engr. CD 6/29.

Wash., Renton—City, City Hall, bond election Sept. 14, 155 ft. through-type girder bridge over Cedar River on Williams St. to replace collapsed structure, $108,750. C. C. Arnold, New World Life Bldg., Seattle, Zone 4, consult. engr. CD 7/21.

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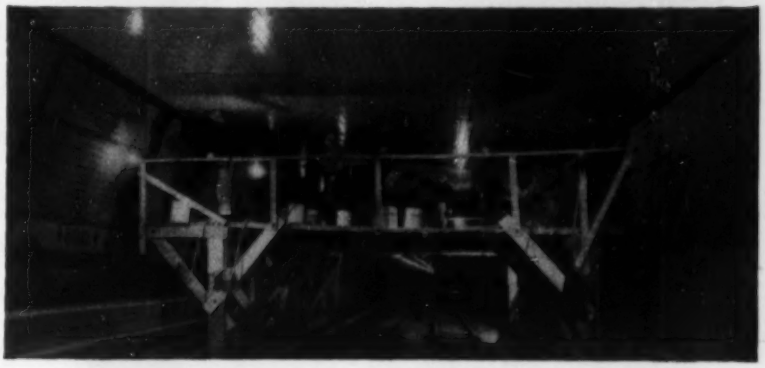

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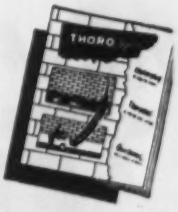

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▲ **Ont., Ottawa**—Municipality, City Hall, George Dunbar Bridge approaches over Rideau Canal at Bronson Ave., $476,533; 6-span 860 ft. bridge over Rideau Canal at Bronson Ave., $700,000. C. C. Parker & Assocs., 745 Main St., Hamilton, consult. engrs. CD 6/28.

Que., Three Rivers—City, R. Lord, mgr., City Hall, bridge, Pont Lajeune over C.P.R. tracks, Ste. Marie St. $200,000. J. M. Langlois, 128 Radisson St., consult. engr. P. E. Dufresne, c/o owner, city engr.

Que., Three Rivers—Municipality, bridge between St. Christophe and Caron Island, $125,000. P. E. Dufresne, City Hall, city engr.

STREETS AND ROADS

Ga., Gainesville—City, bond election Sept. 3, 1955 street imprvs. $200,000.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Brookfield-East Brookfield—road resurf. Rte. 9, $153,000.
Concord—road resurf. Rte. 24, $63,400.
Dighton—road resurf. Rte. 138, $59,300.
Easton—road resurf. Rte. 138, $88,800.
Essex-Gloucester—road resurf. Rte. 121, $239,000.
Gloucester—road resurf. Rte. 127, $101,000.
Groveland—Road resurf. Rte. 113, $58,000.
Norfolk-Wrentham—road resurf. Rte. 1A, $85,100.
Provincetown—road resurf. Rte. M, $62,000.
Reading—road resurf. Rte. 28, $45,400.
Revere—road resurf. Rte. M, $29,700.
Saugus—road resurf. Rte. C-1, $93,700.
Stoneham—road resurf. Rte. 28, $74,400.
Taunton—road resurf. Rte. 44, $33,600.
Westford-Littleton—road resurf. Rte. 110, $217,000.
Weymouth—road resurf. Rte. 3, $140,000.
Woburn-Winchester—road resurf. Rte. 3, $84,300.

Miss., Holly Springs—Bd. Suprvs. Marshall Co., grading, paving 6.565 mi. between Lees and Holly Springs. $100,000. A. L. Goodman Jr., Box 151, Starkville, consult. engr.

N. C., Raleigh—City, City Hall, voted $200,000 bonds July 24, street imprvs. CD 6/30.

O., Cuyahoga Falls—City, pave 13 streets entirely, portions of 7 streets, $500,000. Thomas Sauter, city engr.

Pa., Abington—City Comrs., Abington, street paving, imprvs. various locations, $100,000.

▲ **Tex., Houston**—City, City Hall, 900 Brazos St., voted bonds July 24, bit. topping of streets, $5,375,000; repaving and rehabilitation bit. streets, $275,000; permanent type street paving, mostly concrete, $4,100,000; repairing and rehabilitation permanent type paved streets, $350,000; misc. street drainage, $175,000; misc. street grading, $200,000; misc. street gravelling, $275,000; misc. street concrete curbs and gutters, $250,000. J. G. Rollins, Ch. P. Wks. Eng. CD 6/22.

Tex., Houston—Etheyln Corp., c/o Malcolm McCulloch, 2111 Jensen Dr., concrete-paved streets, adjacent to Willow Bend. $185,000. J. B. Dannenbaum, 3940 Main St., consult. engr.

Tex., Lamesa—Dawson Co., Lamesa, road imprvs., farm to market and paved farm roads, incl. grading, drainage structures, caliche base, triple asph. surf., 10 mi. Precinct 1; $125,000; 12 mi. Precinct 2, $125,000; 9½ mi. Precinct 3, $125,000; 11½ mi. Precinct 4, $125,000. Lubbock Eng. Co., 1638 Main St., Lubbock, consult. engr. CD 6/9.

▲ **Tex., Raymondville**—Willacy County Navigation Comn., Raymondville, voted bonds July 17, dredging ship channel, Port Mansfield to Gulf of Mexico. $2,500,000. CD 7/8.

Wash., Mount Vernon—City, City Hall, street imprvs. $282,000.

Wash., Renton—City, City Hall, bond election Sept. 14, widening Park St., installing mercury vapor lights and traffic signals throughout city. $117,000.

EARTHWORK, WATERWAYS

Ohio—Dpt. Natural Resources, A. W. Marion dir., State Dpt. Bldg., Columbus, constr. 145 acre Hargus Lake, with chimney type outlet and sod spillway, with 49 ft. high dam, near Circleville. $150,000-$175,000. CD 11/3/44, under O., Columbus.

LATIN AMERICA

Mexico, Villahermosa—AIRPORT—Sria. de Communicaciones y Obras, Publicas, Mexico City, plans civil airport. $500,000.

PUBLIC BUILDINGS

▲ **Ariz., Tempe**—DORMITORIES, etc.—State of Arizona State College, Tempe, women's dormitory, $375,000; men's dormitory, $600,000; women's dormitory $400,000; student memorial union bldg., Tempe Campus, $1,250,000. CD 3/27/51.

Ark., Arkadelphia—HIGH SCHOOL—School Dist. 1, Arkadelphia. Plans by Weaver & Stowers, Commercial National Bank, Little Rock, Junior High School. $300,000. CD 3/1/43.

Calif., Corning — SCHOOL — Corning Union Elementary School Dist., Corning, plans by Lawrence G. Thomson, 125 W. Third St., Chico, elementary school. $300,000.

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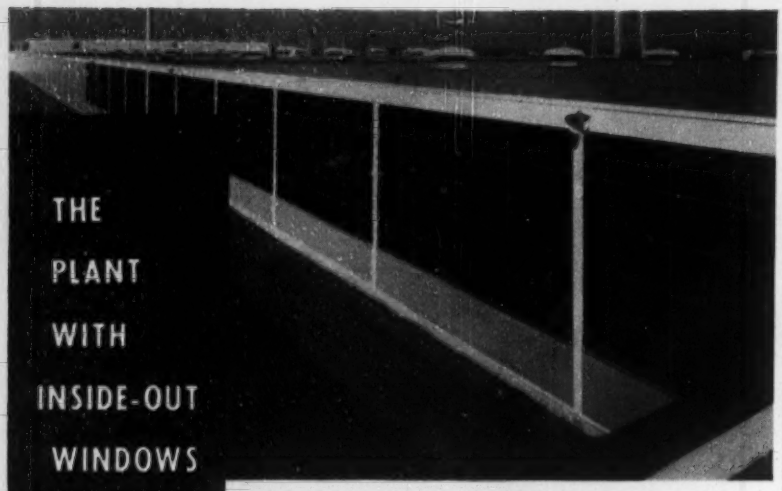

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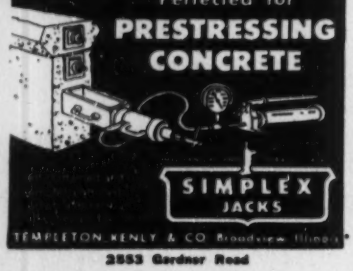

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Calif., Fontana—GYMNASIUM—Chaffey Union High School Dist., Ontario, plans by Neptune & Thomas, 1560 W. Colorado St., Pasadena, 20,000 sq. ft., precast concrete gymnasium at Fontana High School, $300,000.

Calif., Los Angeles—SCHOOLS—Los Angeles City School Dist., 1425 S. San Pedro St., plans by Richard J. Neutra, 2300 Silver Lake Blvd., assembly-cafeteria at Baldwin Hills, Bellflower, Crenshaw and Grape St. Schools, $390,000; plans by C. H. Lewis & P. P. Lewis, 2805 via Le Silva, Palos Verdes, 1 story, frame, stucco Harbin Road School in San Pedro District, $360,000. CD 6/13/52.

Calif., Los Gatos—SCHOOL—Los Gatos Union Elementary School Dist., Los Gatos, voted $300,000 bonds July 16, school addns.

Calif., Monterey — HIGH SCHOOL — Monterey Union High School Dist., Box 1031, plans by Fred Keeble & George Rhoda, 126 Bonifacio Pl., Walter Colton Junior High School. $350,000. CD 11/25.

Calif., Redlands—SCHOOL—Redlands High School Dist., Redlands, plans by Harold Gimeno, 1416½ N. Main St., Santa Ana, Redlands High School addns., $300,000. CD 11/10/50.

Calif., San Jose—SCHOOL—Alum Rock Union Elementary School Dist., North White Rd., voted $522,000 bonds June 23, school constr. CD 5/12.

Calif., San Jose—SCHOOL—Mount Pleasant Elementary School Dist., 63 Neal Ave., plans by Higgins & Root, 220 Meridian Rd., Pleasant Elementary School, White and Story Rds. $350,000.

Calif., Selma—SCHOOL—Selma Elementary School Dist., 2535 B St., plans by Coates & Metz, Helm Bldg., Fresno, elementary school, Floral Ave. $400,000. CD 12/30.

▲ **Conn., New Britain**—SCHOOLS—City, Dr. Joseph T. McCook, supt. schools, 27 Hillside Place, plans by Perley F. Gilbert & Assoc., Inc., 53 Central St., Lowell, Mass., 2 Junior High Schools. $1,500,000.

Conn., Wethersfield—SCHOOL—Town, Elementary School Survey Comn., Wethersfield, Emerson William School addn. $300,000.

Conn., Trumbull—SCHOOL—Town School Comn., Town Hall, plans by Jesse James Hamblin, 1188 Main St., Bridgeport, school, in Park Lane area, $350,000. CD 5/19.

Del., Smyrna—ARMORY—Delaware National Guard, Armory Bldg., Wilmington, plans by Thomas M. Donohue, Marshallton, armory, $130,000.

▲ **Ill., West Chicago**—SCHOOL—School District 94, Joliet Rd., plans by Frazier & Raftery, 315 James St., Geneva, high school addn. $1,000,000.

▲ **Ind., Lafayette**—HOME IMPRVS.—Wm E. Clarkson, Indiana Dir. P. Wks. & Supply, State House, Indianapolis, Lafayette Soldiers Home imprvs., incl. 150-bed hospital, $1,995,000; 16-unit motel-tyoe employees bldg., $125,950; housing units for dept. heads, $110,250; sewerage, boiler, roof, fireproofing and other repairs to present bldgs., $361,450. CD 11/22/43.

Ind., Rochester—SCHOOL—Rochester School Twp. Holding Corp., Rochester, plans by Hamilton & Graham, Muncie, consolidated twp. school, 1¼ mi. west of State Rd. 14. CD 7/23/53.

Ia., Fort Madison—SCHOOL—Bd. Educ., Fort Madison, plans by Karl Keffer & Assocs., 202 Masonic Temple, Des Moines, high school. $325,000.

Ia., Mount Vernon—SCHOOLS—Bd. Educ., defeated $335,000 bonds July 21, elementary school.

Kan., Haysville—SCHOOL—Bd. Educ., high school, $300,000.

Kan., Kansas City—MEMORIAL HALL—City, Bd. Trustees, plans by Raymond Meyn, 2944 N. 53 St., Kansas City, Kan., memorial hall remodel and addn. $425,000

Me., Belfast—HOSPITAL—Waldo County General Hospital, 153 High St., plans by James H. Ritchie & Assoc., 135 Clarendon St., Boston, Mass., hospital alterations, addn. $300,000.

Me., Boothbay Harbor—SCHOOL—Boothbay Harbor School Dist., 15 McKnown St., plans by Miller & Beal, Inc., 465 Congress St., Portland, Junior-Senior High School. $450,000. CD 4/22/52.

Me., Rockland—HOSPITAL—Knox County General Hospital, Rockland, plans by James H. Ritchie & Assoc., 135 Clarendon St., Boston, hospital addn. $350,000.

Mass., Oxford—SCHOOLS—Town, Frank Sannella, supt. Schools, plans by Franklyn R. Williams, 316 Lincoln St., Worcester, 60x330 ft., 40x60 ft. separate wing, elementary school, North Side, $375,000; 60x330 ft. elementary school South Side, $375,000.

Mich., Houghton—DORMITORY—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Ralph Calder, 1212 Kales Bldg., Detroit, dormitory, Michigan College Mining and Technology. $500,000. Snyder & McLean, 18459 W. McNichols St., Detroit, consult. engrs. CD 11/5/45.

Mich., Montague—SCHOOL—Bd. Educ., Montague School Bd., $600,000 bond election Aug. 11, high school, Clark R. Ackley, 1811 E. Michigan Ave., Lansing, archt. CD 6/14.

Mich., Mount Pleasant—SCHOOL—Bd. Educ., voted $1,500,000 bonds Aug. 17, high school, $1,200,000. CD 6/4/53.

Miss., Jackson—SCHOOL—Hinds Co. Bd. Educ., Court House, plans by R. W. Naef, Masonic Bldg., Negro Junior-Senior High School, $300,000.

Mo., Berkeley (St. Louis 21 P. O.) — SCHOOL — School Dist. of Berkeley, Bd. Educ., T. L. Holman, supt. Schools, 6033 Caroline Ave., Zone 21, voted $262,000 bonds July 16, 2 elementary schools, $499,400, Charles W. Lorenz, 700 N. Ballas Rd., Rte. 13, Box 1378, Kirkwood, Zone 22, archts. CD 7/12.

Mo., Kansas City—STORAGE and SHOP—City, City Hall, storage and shop garage for city equip. $667,000.

Mo., Riverview Gardens (St. Louis 15 P.O.)—SCHOOL—School Dist. of Riverview Gardens, Bd. Educ., Everett Lemaster, supt. Schools, 587 Chambers Rd., Zone 15, plans by Walter P. Manske, 9947 Riverview Dr., St. Louis, Zone 15, brick, concrete elementary school, Edgefield Dr. $363,000.

▲ Mont., Billings—COURT HOUSE—Yellowstone Co., voted $1,125,000 bonds July 20, 8 story court house, Chandler C. Cohagen, Hedden Bldg., Billings, archt. CD 12/22.

Mont., Glendive—HOSPITAL—Dawson Co., Court House, voted $300,000 bonds July 20, hospital, $500,000. CD 4/19.

Neb., Lincoln—SCHOOL—Bd. Educ., 720 S. 22 St., plans by S. A. Solheim & Assoc., 324 Sharp Bldg., Triple Unit Elementary School, 65 and Gladstone Sts. $525,000. CD 6/29.

N. C., Raleigh—CITY HALL—City, W. H. Carper, mgr., City Hall, defeated $750,000 bonds July 24, city hall. CD 6/30.

O., Brookville—SCHOOL—Bd. Educ., $450,000 bond election Nov. 2, school. CD 11/12/52.

O., Chagrin Falls—Orange School Bd., Chagrin Blvd., $840,000 bond election Nov. 2, schools and addns. Outcalt, Guenther & Assoc., 13124 Shaker Square, Cleveland, Zone 20, archts. CD 11/10/52.

O., Fostoria—SCHOOL—Bd. Educ., H. L. Ford, supt., $975,000 bond election Nov. 2, grade school, addns., alterations to existing bldgs.

O., Franklin—SCHOOL—Bd. Educ., voted $250,000 bonds July 6, school expansion. $500,000. CD 6/28.

O., Genoa—SCHOOL—Bd. Educ., $518,000 bond election Nov. 2, grade school, remodel existing bldgs.

O., Gibsonburg—SCHOOL—Bd. Educ., $650,000 bond election Nov. 2, grade school.

▲ O., Toledo—PARKING GARAGE—City, City Hall, municipal open-deck parking garage, 7 sites suggested. $414,000-$2,953,000 each, John H. Davis, city engr.

Pa., Bloomsburg—DINING HALL, etc.—General State Auth., 18 and Herr Sts., Harrisburg, plans by John A. Schell, Bloomsburg, dining hall, kitchen at Bloomsburg State Teachers' College. $380,000. A. F. Jones, c/o owner, ch. engr. CD 6/30.

Pa., Indiana—SCHOOL—Indiana Joint School Dist., plans by Hunter Caldwell & Campbell, Altoona, 1 story, brick block elementary school, $500,000.

▲ Pa., Kantner—SCHOOL—Forbes Joint School Dist., Kantner, plans by Hunter Caldwell & Campbell, Altoona, 1 story, steel, brick, block Forbes Joint School, $1,000,000.

▲ R. I., Coventry—SCHOOL—Town, High School, Hopes Rd., plans by Gardiner & Mather, 170 Westminster St., Providence, high school Anthony area. $1,000,000.

R. I., Kingston—DORMITORIES—State & Providence Plants, F. A. Adams, purch. agt., State House, Providence, 2 women's dormitories, University of Rhode Island. $950,000. CD 9/1/48.

S. C., Walhalla—COURT HOUSE—Oconee Co., Walhalla, court house. $350,000.

S. D., Lemmon—ARMORY—South Dakota National Guard, Pierre, and city of Lemmon, armory. $200,000.

Tex., Bloomington—HIGH SCHOOL—Bloomington Independent School Dist., Bloomington, bond election Aug. 10, high school. $500,000. Carl H. Stautz, 1704 Exposition Blvd., Austin, archt. CD 7/21.

▲ Tex., Corpus Christi—SCHOOLS—Corpus Christi Independent School Dist., 515 N. Carancahua St., plans by Brock & Anderson, 210 Jones Bldg., Junior High School, Highland, Chippewa, Francesca and Osage Sts., $600,000; cafeteriums, $300,000; plans by Smyth & Smyth, Gulf Security Bldg., Elementary School No. 2 in Patrick Gardens, $300,000. CD 5/12.

▲ Tex., Denton—POWER PLANT, etc.—City future power plant expansion, $2,000,000; imprvs., rehabilitation existing power plant units, $750,000. Black & Veatch Eng. Co., 4706 Broadway, Kansas City, Mo., consult. engr.

Tex., Houston—LIBRARY—City, City Hall, plans by Harvin C. Moore, 2008 W. Alabama St., branch library, $350,000.

▲ Tex., Houston — SCHOOLS — Houston Independent School Dist., 1300 Capitol St., voted bonds July 24, Junior High Schools, School No. 1, $750,000; School No. 2, $950,000, School No. 3, $550,000, School No. 4, $700,000; Senior High Schools, School No. 1, $1,450,000; School No. 2, $775,000, School No. 3, $850,000, School No. 4, $835,000; Elementary Schools, School No. 1, $750,000, School No. 2, $600,000, School No. 3, $850,000, School No. 4, $925,000, School No. 5, $550,000, School No. 6, $575,000, School No. 7, $875,000, School No. 8, $965,000, School No. 9, $825,000, School No. 10, $800,000, School No. 11, $875,000, School No. 12, $500,000. Stayton Nunn, 3272 Westheimer St., Bd. Archt. CD 5/13.

Tex., Longview—COURT HOUSE ANNEX—Gregg Co., Earl Sharp, Judge, 2 story court house annex, $300,000.

▲ Tex., Lubbock—GYMNASIUM—Texas Technological College, Lubbock, 1 story, brick gymnasium. $1,000,000.

Tex., Sherman—HOSPITAL—City, City Hall, plans by J. H. Brown & J. L. Chapman, archts, 424 N. Rusk St., and Probst & O'Connell, assoc. archts., 504 W. 7 St., Austin, city hospital. $505,000. CD 7/21.

Wash., Edmonds—SCHOOL—School District 15, Edmonds, plans by Johnson & Botesch, First Natl. Bank Bldg., Everett, Maple Park School to serve area north of Lynnwood-Edmonds Rd. between Hy. 99 and Puget Sound. $450,000.

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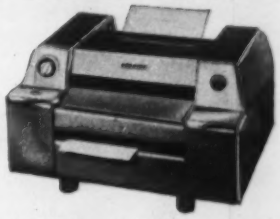

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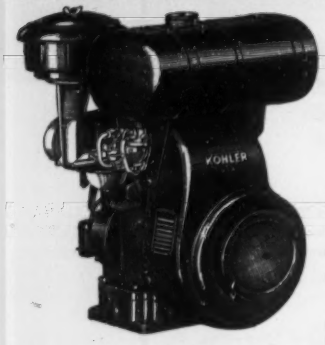

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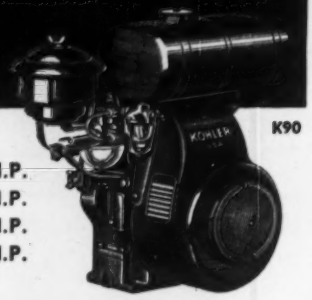

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▲ **Tex., San Antonio**—DWELLINGS—Bellaire Lumber Co., 7903 S. Flores St., Second Section; 46 frame, brick trim dwellings, concrete slab. $439,500; 44 frame dwellings, concrete slab fdn., $419,500; 38 brick veneer dwellings, concrete slab fdn., $372,000; 31 frame, cedar shake dwellings, concrete slab fdn., $310,000; 28 frame, masonry trim dwellings, concrete slab fdn., $300,000; 35 frame dwellings, concrete slab fdn., $345,150; 41 frame dwellings, concrete slab fdn., $395,160, off Military Hy., Pleasanton Rd.

▲ **Tex., San Antonio**—DWELLINGS—Northwest Subdivision, Inc., Babcock Rd., 30 frame, dwellings, concrete slab fdn., $315,000; 35 frame, asb. siding dwellings, concrete slab, $358,615; 28 brick veneer, dwellings, concrete slab, $328,115; 38 frame dwellings, $380,000, tract bounded by Babcock and Hillcrest Rds.

▲ **Utah, Ogden**—STORE—C. A. Anderson Store, 2265 Washington Blvd., Washington Terrace, plans by John Graham, Dexter Horton Bldg., Seattle, Wash., 2 story store. $2,000,000.

Utah., Salt Lake City—BANK—Continental Bank & Trust Co., Walt. E. Cosgriff, pres., Second S. and Main Sts., plans by R. Lloyd Snedaker, 706 Utah Saving & Trust Bldg., 3 story exten. to bank, 21-25 W. Second South. $700,000.

Vt., Bennington—HOSPITAL—Henry W. Putnam Memorial Hospital, Dewey St., plans by James H. Ritchie & Assoc., 135 Clarendon St., Boston, hospital addn., alterations, $300,000.

Wash., Kennewick—MEDICAL, DENTAL CENTER—Dr. Raymond Kerr, Kennewick, plans by T. F. Hargis, Yakima, 25-unit medical-dental center. $500,000.

Wash., Renton—STORE—R. C. Storey, Renton, 2 story bsmnt., 100x115 ft. store for lease to J. C. Penney Co. $450,000.

▲ **Wash., Seattle**—HOUSES—A. Balch, 8050 35 Ave. N E.., 80 houses in area between E. 72 and 75 Sts. 42 to 45 Aves. N. E. $2,000,000.

▲ **Wis., Milwaukee**—ORPHANAGE—St. Aemilians Orphanage, 2017 N. 60 St., plans by E. Brielmaier & Sons Co., 735 N. Water St., Zone 2, orphanage. $1,000,000.

Wis., Milwaukee—SCHOOL—St. Albert's Catholic Congregation, 4717 N. 38 St., plans by Wm. G. Herbst & Assocs., 1249 N. Franklin St., parochial school. $300,000.

Wis., Waukesha—DORMITORY—Carroll College, 100 N. East Ave., plans by Frank C. Shattuck, 174 E. North Water St., Neenah, 4 story, bsmnt. dormitory. $525,000. CD 7/19.

▲ **Man., Winnipeg**—OFFICE—A. W. Mitchell (Jewellers) Portage Ave., plans by Green, Blankstein, Russell & Assocs., 310 Times Bldg., 7 story, bsmnt. office bldg., Portage and Hargrave Aves., $2,000,000.

INDUSTRIAL BUILDINGS

Ark., Conway—PLANT—Conway Corp., Conway, plant, $100,000.

▲ **Fla., Tampa**—FLOUR MILL—Dixie Lily Milling Co., 110 S. Nebraska Ave., flour mill. $1,000,000.

Ga., Atlanta—WAREHOUSE, OFFICE—Hopper & McCoy, 454 Marietta St. N.W., Atlanta, plans by Robert & Co. Assocs., 96 Poplar St. N.W., warehouse-office. $100,000.

▲ **Md., Baltimore**—PLANT—Glidden Co., Berea and Madison Sts., Cleveland, O., titanium dioxide and sulphuric acid plant, first unit 15 bldgs. incl. offices, laboratories, power plants, production facilities. $10,000,000.

▲ **Mich., Muskegon** — MARINE TERMINAL — Michigan Foundry Supply Co., Paul M. Wiener, pres., Muskegon, marine terminal facilities to berth 4 ocean going freighters, warehouse, storage, office bldgs., 140,000 sq. ft. Muskegon Lake city's outlet to Lake Michigan. $3,000,000.

▲ **Minn., New Ulm**—PLANT—Kraft Foods Co. of Wisconsin, 520 Broadway, Green Bay, Wis., 1 story, 170x566 ft., food processing plant, three annexes 123 ft. long with widths 87, 40 and 70 ft. respectively. $1,000,000.

▲ **Mo., Creve Coeur (St. Louis 24 P.O.)**—RESEARCH CENTER—Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo., plans by Holabird & Root and Burgee, 180 N. Wabash St., Chicago, Ill., 2 story research center for organic chemicals, to contain 32 laboratory units, 16 offices, demonstration area on 250 acre tract Olive St. road east of Lindberg Blvd. $1,000,000.

N. Y., New York—AUTO STORAGE—Manhattan Pontiac Corp., 775 Broadway, Zone 19, plans by Horace Ginsbern & Assoc., 205 E. 42 St., Zone 17, altering auto storage and garage, 677 Eleventh Ave. $125,000.

O., Columbus—SALES AND SERVICE—Fruehauf Trailer Co., 10940 Harper St., Detroit, Mich., concrete block, brick, steel rein.-con., sales and service bldg., 4340 W. Broad St. $210,000.

O., Columbus—INDUSTRIAL—Phillipi Realty Co., 1147 Chesapeake Ave., industrial bldg., Phillipi Rd. $127,000.

O., Findlay—LABORATORY—Eastman Kodak Co., 343 State St., Rochester, N. Y., 1 story, 60,000 sq. ft. laboratory for processing color film, $600,000.

O., Greenville—SUB-STATION—Dayton Power & Light Co., 25 N. Main St., Dayton, sub-station, $335,000.

O., Mount Gilead—PLANT—Mount Gilead Farm Bureau Co-operative, Robt. Wehr, mgr., Mount Gilead, fertilizer plant on 30 acre site in Washington Twp. $750,000.

Neb., Lincoln—SCHOOL—Catholic High School, c/o Chancery Office, 514 S. 18 St., plans by Fritz Craig, 724 First National Bank Bldg., Catholic high school, $400,000-$500,000.

▲ N. Y., New York—APARTMENT—Interstate Land Holding Co., 1 Wall St., New York 5, N. Y., plans by Eggers & Higgins, 100 E. 42 St., Zone 17, apartment, 959-967 Madison Ave., $1,725,000.

N. Y., New York—APARTMENT—McLean Avenue Realty Corp., 825 E. 140 St., Zone 54, plans by Julius Fishkind, 161-19 Jamaica Ave., Jamaica, 6 story apartment, Virco Ave. and McLean Ave. $768,000.

N. Y., Yorktown Heights—SHOPPING CENTER—Jesse Deitch & Levine Raynes, c/o Henry G. Greene, archt., 855 Sixth Ave., New York, Zone 1, shopping center, on 14 acre tract on Main St. $300,000.

▲ O., Bellbrook—HOUSES—Gagel Constr. Co., c/o J. Fred Gagel, 933 E. Schantz Ave., Dayton, 240 prefabricated houses by National Homes, Inc., on 80 acre tract on north edge of Bellbrook, southeast of Dayton. $1,500,000.

▲ O., Dayton—HOMES—G. W. Leckrone & Sons, Inc., 4711 S. Dixie Hy., 110 ranch-style brick homes in Timberly Acres development fronting north side of Feedwire Rd., east from Possum Run Rd. to Little Sugar Creek Rd. in Greene Co., southeast of here. $2,500,000.

▲ O., Windham (near Warren)—HOMES—Philnat Corp., c/o Nathan and Philip Seltzer, 1512 Walnut St., Phila., Pa., imprvs. at Maple Grove Housing Proj. 1,000 family development, incl. new siding, renovation of interiors, changing heating sys. from coal to gas, $1,000.000

O., Youngstown—SHOPPING CENTER—Glenwood Plaza, Inc., c/o Frank A. Mastriana, atty., Central Tower Bldg., shopping center 510 ft. long, Glenwood Ave. exten. and Boardman-Canfield Rd. $400,000.

Okla., Tulsa—SHOPPING CENTER—F. H. Pratt, Mayo Bldg., shopping center, Pine St. and Sheridan Rd. $700,000.

Okla., Tulsa—OFFICE—Great Southern Life Co., 15 E. 21 St., plans by Mary Caroline Cole, 15 E. 21 St., office, 21 and Utica Sts., $350,000.

▲ Pa., Phila.—APARTMENT—Madway Constr. & Engineers, Wayne, 490 apartment development units, off street parking 60 St. and City Line Ave. $2,500,000.

Pa., Pittsburgh—SHOPPING CENTER—W. F. Murdock, Kings School Rd., Library, plans by Thomas B. Garman, 701 Washington Rd., 1 story, 160x320 ft., brick, block shopping center, South Park, Bethel Boro. $300,000.

Pa., Rosemont—HOME—St. Edmonds Home for Crippled Children, 1712 Summer St., Phila., plans by Paul Monaghan, 1411 Walnut St., Phila., children's home, $300,000. CD 10/14/53.

Tenn., Memphis—OFFICE—Jackson Life Insurance Co., Falls Bldg., office. $500,000.

▲ Tenn., Whitehaven — RESIDENCES, etc. — John B. Goodwin Builder, Commerce Title Bldg., Memphis, 1,200 residences and shopping center. $25,000,000.

▲ Tex., Bellaire—DWELLINGS—Meyerland Co., c/o Thomas A. Robinson, Jr., 510 Taft St., Houston, plans by Thompson McCleary, 2017 W. Gray St., Houston, 20 dwellings, $370,000; 23 dwellings, $392,150; 33 dwellings, $435,600; 30 dwellings, $389,100; 18 dwellings, $339,350; 28 dwellings, $358,750; 16 dwellings, $316,000; 26 dwellings, $338,000. Hilson & Coulson, 3821 Fannin St., Houston, consult. engrs.

▲ Tex., Dallas — DWELLINGS — Mayflower Investment Co., c/o Carr P. Collins, 912 Commerce St., (A) 41 dwellings $391,500 (B) 28 dwellings, $315,750 (C) 39 dwellings $368,150 (D) 25 dwellings, $300,000 (E) 34 dwellings, $348,000 (F) 36 dwellings, $357,600 (G) 45 dwellings, $398,000 in an addnl. area of Plymouth Park Community.

Tex., Fort Worth—DORMITORY—Texas Christian University, c/o Dr. M. E. Sadler, pres., plans by Wyatt C. Hedrick Co., 1200 T. & P. Bldg., 3 story, brick, tile boys dormitory. $400,000. CD 6/4.

Tex., Hale Center—HOUSING—H. D. Davis & Cecil Hale, Hale Center, frame, asb. siding housing, concrete slab fdn. $315,000.

▲ Tex., Houston—DWELLINGS—Ethelyn Corp., Malcolm McCulloch, c/o McCulloch Lumber Market, 2111 Hensen Dr., plans by Jas. D. Johnson, 2518 Huldy St., for 1955 Early, Job 1, 30 dwellings, $414,500; Job 2, 33 dwellings, $459,000; Job 3, 18 dwellings, $305,000; Job 4, 28 dwellings, $378,750; Job 5, 23 dwellings, $361,400; Job 6, 26 dwellings, $358,180; Job 7, 35 dwellings, $463,290. J. B. Dannenbaum, 3940 Main St., Houston, consult. engr. for 1954, (a) 28 frame dwellings, $398,500 (b) 21 cedar shake dwellings, $300,000 (c) 31 brick dwellings, $439,125 (d) 27 cedar shake frame dwellings, $383,385 (e) 40 brick dwellings, $518,625 (f) 34 brick, cedar shake dwellings, $378,216 (g) 45 cedar shake, frame dwellings, $545,190 (h) 37 cedar shake, brick, frame dwellings, $391,220, all adjacent to Willow Bend.

▲ Tex., Pasadena—DWELLINGS—Marvin Henry Builders Inc., 2002 Chippendale St., Houston, (a) 30 dwellings, $309,500, (b) 39 dwellings, $361,000, (c) 44 dwellings, $389,550, (d) 28 dwellings, $300,000, (e) 36 dwellings, $339,300, (f) 34 dwellings, $318,000, (g) 43 dwellings, $378,600, second section on 248-acre off Red Bluff Rd., Tanglebriar Subdivision.

▲ Tex., Pasadena—DWELLINGS—Parker Brothers & Co., Inc., 5303 Navigation Blvd., Sec. 1, 28 dwellings, $314,100; 32 dwellings, $336,400; 22 dwellings, $300,000; 26 dwellings, $309,500; 31 dwellings, $344,160; 36 dwellings, $368,000; 44 dwellings, $388,750; 41 dwellings, $370,000; 1 mile beyond South Ave. outside city limits.

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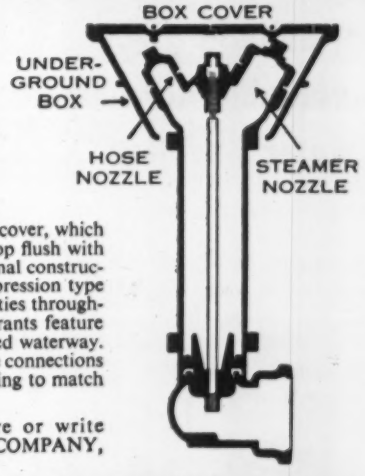

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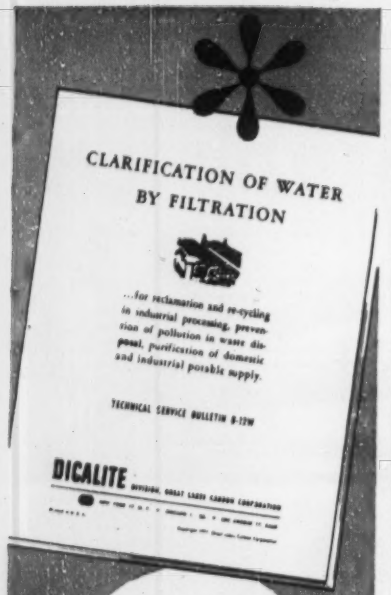
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Wash., Prosser—LABORATORY, etc.—Washington State College, Pullman, research laboratory and office at Irrigation Experiment Station $811,500. CD 1/7/48.

▲ Wash., Pullman—PLANT SCIENCE, etc.—Washington State College, Pullman, plant science bldg. with agronomy seed house, $3,445,900, CD 8/5/48; utility expansion and extension, $1,624,500; men's gymnasium addn., $1,000,000; women's gymnasium addn., $500,000, nuclear reactor and radio facilities, $500,000.

Wash., Seattle—HOSPITAL—King Co., County-City Bldg., Seattle, Zone 4, remodeling former Orthopedic Hospital for use as county hospital, $412,000.

Wyo., New Castle—SCHOOL—School District No. 1, Weston Co., New Castle, plans by Goodrich & Wilking, 226 E. Second St., Casper, high school, $400,000. CD 3/17.

▲ Ont., Toronto—SCHOOLS—North York Twp. Bd. Educ., H. M. Brownlee, admn., 7 Kenneth St., Willowdale, plans by J. B. Parkin Assocs., 717 Church St., high school in Don Mills. $1,300,000, CD 7/1; plans by Page & Steele, 72 St. Clair Ave., high school in York Mills, $1,400,000. CD 6/21.

Sask., Regina—DWELLING UNITS—Dpt. Justice, Govt. of Canada, Ottawa, Ont., 18 multiple dwelling units providing 72 homes for Royal Canadian Mounted Police in northwestern section of city. $500,000.

COMMERCIAL BUILDINGS

Calif., Corona—DWELLINGS—Boswell Alliance, 308 Monterey Rd., Pasadena, 30 frame, stucco dwellings in Francis Square Tract. $300,000.

▲ Calif., Millbrae—HOUSING—The Stoneson Development Corp., 3455 19 Ave., San Francisco, 800-home subdivision, $11,000,000.

Calif., San Fernando—DWELLINGS—Malouf-Frantz Co., 1320 N. San Fernando Rd., Burbank, plans by Marvin C. Johnson, 5159 Cahuenga Ave., North Hollywood, 30 frame, stucco dwellings, in San Fernando Area, $300,000.

Calif., West Covina—DWELLINGS—Walker Built Homes, Inc., 1133 S. Lark Ellen St., 76 frame, stucco dwellings in Tract 20041. $750,000.

Calif., Whittier—DWELLINGS—Western Projects Corp., 3842 Wilshire Blvd., Los Angeles, 130 frame, stucco dwellings, Fernview, Jenkins, and Scott Sts.

Conn., East Hartford — CHURCH — Blessed Sacrament Church, Rev. Henry J. Murphy, pastor, 36 Cambridge Dr., plans by Walter R. Furey, 106 Main St., Thompsonville, church Brewer St. exten., near Forbes and Brewer Sts. $300,000.

▲ Conn., Hartford—HOME OFFICE—Connecticut Mutual Life Insurance Co., Peter M. Frazer, pres., 140 Garden St., Conn., plans by R. B. O'Connor & W. H. Kilham, Jr., 101 Park Ave., New York, N. Y., 6 story, 70,000 sq. ft. Home Office addn., 140 Garden St. $1,000,000.

▲ Colo., Denver—SHOPPING CENTER—Alameda Shopping Center, Inc., and Paul M. Newstrom, 2000 W. 8 St., 40-unit shopping center, W. Alameda and Zuni Sts. $4,500,000.

Fla., Coral Gables—OFFICE—Edward D. Rogers, 249 Alhambra Circle, plans by Leroy K. Albert, 251 Alhambra Circle, office. $350,000.

Fla., Orlando—SCHOOL—Diocese of St. Augustine, St. Augustine, plans by Thomas J. Madden, Jr., 2344 Biscayne Blvd., Miami, Catholic High School. Over $300,000.

Fla., Orlando—HOSPITAL—Orange Memorial Hospital, Orlando, plans by Raymond C. Stevens, 1920 N. Orange Ave., hospital addns. $404,500.

Ind., Indianapolis—CLUB HOUSE—Miramar Swimming & Recreation Club, P. O. Box 5643, Indianapolis, plans by C. Wilbus Foster & Assocs., 4741 E. Washington St., Zone 1, 1 story, bsmnt., 21,000 sq. ft., brick, rein.-con. club house, with 165x300 ft. swimming, 700-car paved parking lot, 2 concrete wading pools, and tennis courts, putting greens, $500,000.

Ia., Des Moines—STORE—S. S. Kresge Co., 2727 2 St., Detroit, Mich., branch dime store addn., remodeling, $500,000.

Ia., Forest City—DORMITORY—Waldorf College, Forest City, plans by Thorson, Thorson & Madson, Forest City women's dormitory, $300,000.

Ia., Templeton—SCHOOL, etc.—Sacred Heart Parish, Templeton, plans by J. E. Loftus, Omaha Natl. Bank Bldg., Omaha, grade-high school. $350,000. CD 7/24.

Kan., Kansas City—STORE—Frank Gruble Estate, 632 Minnesota Ave., Kansas City, Kan., plans by Bloomgarden & Frohwerk, Railway Exchange Bldg., Kansas City, Mo., rebuilding clothing store, $300,000. Leader Clothing Store, lessee.

Mass., Malden—TEMPLE—Teffureth Israel, Salem St., plans by Isidor Richmond & Carney Goldberg, 16 Arlington St., Boston, temple, Branch and Salem Sts. $300,000.

Mich., Albion—DORMITORIES, etc.—Albion College, W. W. Whitehouse, pres., Albion, 2 brick, concrete women's dormitories, and dining hall. $600,000.

Miss., Jackson—OFFICE—United Gas Corp., 1525 Fairfield Ave., Shreveport, La., plans by Wm. S. Evans, Johnson Bldg., Shreveport, La., office. $400,000. CD 12/31/52.

Mo., Joplin — HOSPITAL — Freeman Hospital, Joplin, plans by Hewitt & Royer, 1203 Locust St., Kansas City, Mo., hospital addn., $300,000.

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Tex., **Panhandle**—PLANT IMPRVS.—Pioneer Natural Gas Co., 1003 Texas Ave., Lubbock, plant imprvs. in South Plains Area. $500,000.

Tex., **San Antonio**—GARAGE, etc.—L. R. Pietz, 1231 N. W. 36 St., masonry garage, repair, service station, $200,000.

Tex., **Texarkana**—PLANT—American Cross Arm & Conduit Co., J. R. Childs, mgr., Texarkana, reconstr. mfg. plant. $175,000.

Wash., **Seattle** — PARKING GARAGE — Pacific National Bank, 900 20 Ave., Seattle, Zone 4, plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., 1 story, 80x240 ft. rein.-con. parking garage, $110,000.

▲ Wis., **Cassville** — GENERATING PLANT — Wisconsin Power & Light Co., 122 W. Washington Ave., Madison, steam electric generating plant, north of here. $20,000,000.

▲ Ont., **Hamilton** — PLANT — Dominion Foundries & Steel Ltd., Depew St., plans by Prack & Prack, 310 Main St., E., plant expansion, $3,500,000. CD 7/21.

Ont., **Hamilton**—DAIRY—Royal Oak Dairy Ltd., 225 East Ave. N, plans by Kyles & Kyles, 247 John St., S., dairy addn. $125,000.

UNCLASSIFIED

▲ **Alabama**—RURAL DISTRIBUTION LINES—Alabama Electric Co-operative, Inc., Andalusia, 57 mi. 46 KV trasmission line, 45 mi. 115 kv transmission line and sub-station facilities, Montgomery Co. $2,973,000.

Ala., **Selma**—TELEVISION STATION—Dallas Broadcasters, Inc. (WGWC), Box 686, television station (Ch. 8). $149,000. W. J. Holey, 1146 Biarcliff Place, N.E., Atlanta, Ga., consult. engr.

Ala., **Selma**—TELEVISION STATION—Deep South Broadcasting Co., Box 1447, Montgomery, television station (Ch. 8), $136,000. William E. Benns, Jr., 3738 Kanawha St. N.W., Wash., D. C., consult. engr.

Arkansas—RURAL DISTRIBUTION LINES—Ashley-Chicot Electric Co-operative, Hamburg, 28 mi. rural distr. lines and sys. imprvs., Ashley Co. $275,000. CD 5/27/48.

Arkansas — RURAL DISTRIBUTION LINES — Raceland Electric Co-operative, Stuttgart, 62 mi. rural distr. line and sys. imprvs., Arkansas Co. $422,000. CD 5/27/53.

Ark., El Dorado—TELEVISION STATION—Television Enterprises, Inc., Box 610, television station (Ch. 10) $196,000. Guy C. Hutcheson, 1100 W. Abram St., Arlington, Tex., consult. engr.

Ark., Hot Springs—TELEVISION STATION—Southern Newspapers, Inc., 912 Central Ave., television station (Ch. 9), $185,000. Commercial Radio Equipment Co., 1319 F St. N.W., Wash. 4, D. C., consult. engr.

Ark., North Little Rock—TELEVISION STATION—Arkansas Telecasters, Inc., 300 W. Washington Ave., television station, $749,000. Commercial Radio Equipment Co., 1319 F St. N.W., Wash., Zone 4, D. C., consult. engr.

Calif., Corona—TELEVISION STATION—KOWL Broadcasting Co., Pico Blvd., Santa Monica, television station KCOA, $206,000. Harry R. Lubcke, 2443 Creston Way, Hollywood 28, Calif., consult. engr.

Calif., El Centro—TELEVISION STATION—Sidney A. Franklin, Jr., 28820 Cliffside Dr., Rt. 2, Malibu, television station, $136,000. Bond, Connor & Oakley, 4629 Encinas Dr., La Canada, consult. engrs.

Calif., El Centro—TELEVISION STATION—Valley Empire Telecasters, 71495 San Gorgona Rd., Rancho Mirage, television station. $161,000. Harry R. Lubcke, 2443 Creston Way, Hollywood, Zone 28, consult. engr.

Calif., Los Angeles—TELEVISION STATION—KFWB Broadcasting Corp., 6419 Hollywood Blvd., Hollywood, television station KFWB (Ch. 34), $359,000. Weldon & Carr, 1001 Connecticut Ave. N.W., Wash. 6, D. C., consult. engrs.

Calif., Merced—TELEVISION STATION—Merced Television Corp., 270 Park Ave., New York, N. Y., television station KMER, $248,000. Frank H. McIntosh, Wyatt Bldg., Wash., 5, D. C., consult. engr.

Conn., Hartford—RAILROAD STATION—City of Hartford, City Hall, Hartford and New York, New Haven & Hartford R.R., T. P. Polson, ch. engr., 54 Meadow St., New Haven, Zone 6, railroad station with parking area, North Meadows Site, $300,000.

Florida—RURAL DISTRIBUTION LINES—Withlacoochee River Electric Co-operative, Dade City, 76 mi. rural distr. lines and sys. imprvs., Pasco Co. $450,000. CD 7/14/50.

Illinois—RURAL DISTRIBUTION LINES—Southeastern Illinois Electric Co-operative, Eldorado, 15 mi. rural distr. lines and sys. imprvs., Saline Co. $340,000. CD 7/23/51.

Mich., Midland—SKATING RINK—City, Kenneth Lybolt, clk., 80x100 ft. outdoor skating rink. $100,000.

▲ **Mich., Romeo**—CAR TESTING FACILITIES—Ford Motor Co., Earle S. MacPherson, vice pres., in charge of engr., 2866 Penobscot Bldg., Detroit, Michigan Proving Ground, 4,000 acre site purchased to provide car testing facilities, incl. Five-Mile high speed track, network of test roads, fueling facilities, garages, storage facilities, offices. $5,000,000-$15,000,000.

Minnesota—RURAL DISTRIBUTION LINES—Red Lake Electric Co-operative, Red Lake Falls, 50 mi. rural distr. lines, sys. imprvs., Red Lake Co. $223,000.

Missouri—RURAL DISTRIBUTION LINES—Ozark Electric Co-operative, Mount Vernon, 34 mi. rural distr. lines, sys. imprvs., Lawrence Co. $210,000. CD 1/8.

Missouri — RURAL DISTRIBUTION LINES — Scott-New Madrid-Mississippi Electric Co-operative, Sikeston, 105 mi. rural distr. lines, sys. imprvs., Mississippi Co., $600,000.

▲ **N. Y., New York**—PIER—Dpt. Marine & Aviation, Pier A, North River, Zone 4, 2 story, 125x755 ft. Pier 54, foot of West 54 St., to be leased to Italian Line. $4,500,000. CD 8/17/45.

▲ **O., Ashtabula**—HARBOR IMPRVS—City, Ned V. Collander, city engr., harbor imprvs., incl. widening bends in Ashtabula River, dredging an access channel and turning basin and harbor to uniform 27 ft. $4,900,000.

▲ **O., Cincinnati** — CONVEYOR BELT SYSTEM — City, City Hall, underground conveyor belt sys. to transport shoppers to core area from perimeter parking lots. $5,000,000. T. J. Montgomery, city engr.

O., Dayton — SWIMMING POOL — City, Herbett W. Starick,, mgr., City Hall, gymnasium, $85,000, swimming pool and filter equip.; $70,000. CD 6/30.

South Dakota—RURAL DISTRIBUTION LINES—Tri-County Electric Assn., Plankinton, 106 mi. rural distr. lines, sys. imprvs., Aurora Co. $165,000. Raymond H. Reed & Co., Columbus, Neb., consult. engrs. CD 7/28.

Texas — RURAL DISTRIBUTION LINES — Lamb County Electric Co-operative, Littlefield, 22 mi. rural distr. lines and sys. imprvs., Lamb Co. $128,000.

Texas—TELEPHONE LINES—Mid-Texas Telephone Co., Willard S. Bain, pres., South Texas Bldg., San Antonio, imprvs., extens. to pole telephone lines, Fort Hood, $75,000; imprvs., extens. to pole telephone lines, Buckholts, $90,000; imprvs., extens. to pole telephone lines, Belton, $100,000.

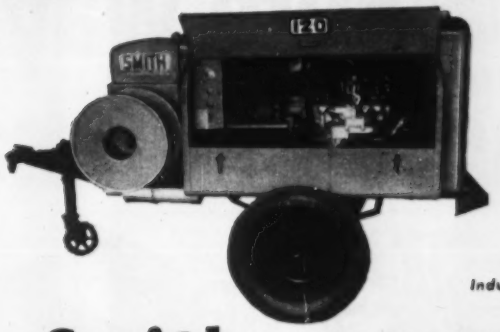
Tex., Bellaire—LIGHTING and GAS LINES—Meyerland Co., c/o Thomas A. Robinson, Jr., 510 Taft St., Houston, street lighting, $60,000; gas lines, $60,000. Hilson & Coulson, 3821 Fannin St., Houston, consult. engrs.

▲ **Tex., Denton**—ELECTRIC DISTRIBUTION SYSTEM, etc.—City, rehabilitation electric distr. sys., $400,000; expansion of electric distr. sys., $750,000. F. W. Woodruff Eng. Co., First Natl. Bank Bldg., Ft. Worth, consult. engr.

Tex., Panhandle—DISTRIBUTION FACILITIES, etc.—Pioneer Natural Gas Co., 1003 Texas Ave., Lubbock, expansion of distr. facilities, $2,000,000; expansion of transmission facilities, $2,000,000, in South Plains Area.

Wash., Renton—SWIMMING POOL—City, City Hall, bond election Sept. 14, swimming pool, $110,000.

▲ **Alaska**—HYDRO SITES—Chugach Electric Assn., Anchorage, development of hydro sites on Kenai peninsula and new transmission line network, $6,300,000.



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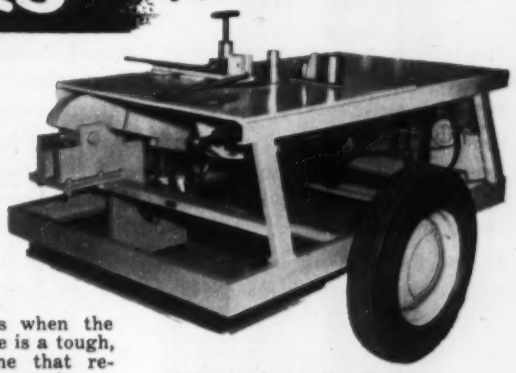

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BIDS ASKED—BUILDINGS

▲ **Mass., Somerville**—SCHOOL—BA 8/26—City, City Hall, elementary school Capen St., $270,000-$300,000. Plans deposit $50 refundable; elementary school, Meacham St., $1,100,000. Plans deposit $150 refundable. Perley F. Gilbert & Assoc., Inc., 53 Central St., Lowell, archt. CD 9/17/52.

▲ **Mass., West Springfield**—SCHOOL—BA 8/26—Town, High School Bldg. Comn., Town Hall, high school Piper Rd., $2,900,000. Plans deposit $75, refundable. Extended date. Warren H. Ashley, 967 Farmington Ave., West Hartford, Conn., archt. Paul B. Johnson, 66 Veron St., Springfield, assoc. archt. CD 7/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Central Constr. Co. of Lawrence, 6 Beacon Ave., Lawrence, Mass. LB $2,874,531, est. $3,000,000. hy. and bridge constr., Kingston-Duxbury. Bids Aug. 3. CD 7/27.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Wadhams & May Co.,** 15 Lewis St., Hartford, Conn. LB $1,980,000, est. $2,700,000. public LIBRARY Sheldon Arch and Prospect Sts., HARTFORD, CONN. City, C. F. Sharpe, city mgr., 550 Main St., Hartford, Conn. Bids Aug. 3. CD 7/13.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

▲ **N. Y., Mineola**—BA 8/24—Nassau Co. Bd. Suprvs., Old County Court House, Mineola, sewer sys. to serve Roosevelt Field-Carle Place Industrial area incl. 50,000 ft. lateral sewer lines and 22,000 ft. trunk sewers, Carle Place, $2,000,000. CD 9/19/51.

BIDS ASKED—BUILDINGS

▲ **D. C., Wash.**—SHRINE—BA 9/8—At office Maginnis & Walsh, archts., 126 Newbury St., Boston, Mass., stone, masonry shrine, Catholic University of America Grounds. for Trustees of the Shrine of the Immaculate Conception, c/o Most Rev. Richard J. Cushing, 1 Lake St., Brighton, Mass. $12,000,000. CD 12/5/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—New York State Bridge Auth., 22 Ferry St., Kingston,
Harris Structural Steel Co., 419 Fourth Ave., New York 10, N. Y., CA $9,496,431. Contr. No. 2, superstructure of Kingston-Rhinecliff Bridge over Hudson River, incl. 2,563 lin. ft. approaches having deck plate girder spans varying from 87 to 150 ft. long; 5,200 lin. ft. truss spans over the river, incl. two simple truss spans 298.5 ft., two three-span continuous truss (498 ft., 800 ft., 498 ft.) over two river channels and one two-span continuous truss with 498 ft. spans, Ulster and Dutchess Counties. Bids July 26. CD 7/28, under LB.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Corbetta Contg. Co., Inc., 220 E. 42 St., New York, N. Y. CA, $15,416,893. est. $17,921,000. 2.94 sect. State Thruway's Southern Westchester connection along Central Park Ave. in Yonkers, Westchester Co.;
The Tomlinson Constr. Co., Ltd:. Rotterdam Junction, N. Y. CA, $4,250,001. est. $4,948,000, work of 13.32 mi. Grand Island portion of New York State Thruway's Niagara Sect. between Buffalo and Niagara Falls, Erie Co. Bids May 20. CD 5/24, under LB.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Bethlehem Steel Co., 25 Broadway, New York, N. Y. CA, $2,335,972, Contract No. N-P, superstructure steelwork, for viaduct in Newark, Newark Bay-Hudson County Extension, Hudson Co. Bids June 22. CD 6/24, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bel-Mor Shores,** c/o Nassau Homes Realty Corp., 1 N. Merrick Ave., Merrick N. Y. Owner Builds. $4,400,000. 400 HOUSES, 100-acre tract, Newbridge Rd. and Hewlett Lane, BELLMORE, N. Y.

▲ **Lasker-Goldman Corp.,** 50 E. 42 St., New York 17, N. Y., CA, $2,835,000, general constr.;
Mechanical Installations, Inc., 24-16 Bridge Plaza South, Long Island City, N. Y. CA, $977,000. heating;
C. K. Rehner, Inc., 623 10th Ave., New York 19, N. Y. CA, $730,537, plumbing;
RAO Electric Equipment Co., 150 E. 41 St., New York 17, N. Y. CA, $683,700, electrical work for alterations addns. to BASIC SCIENCES BLDG. State University Medical Center, SYRACUSE, N. Y. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids May 27, awarded July 13. Grand total $5,226,237. CD 6/2, under LB.

▲ **Somerset Hills Estates Inc.,** c/o A. E. Ludovice, 125 Stout Ave., Middlesex Boro, Bound Brook, N. J., Owner Builds, $4,000,000, 200 HOUSES on 277 acre tract on Route 202-206, 2 mi. north of here, SOMERVILLE, N. J.

▲ **Joseph Skilken & Co.,** 383 S. 3 St., Columbus, O. CA, Approx. $10,000,000. 1 story brick, tile, steel frame SHOPPING CENTER, Collier Twp. near BRIDGEVILLE, PA. Great Southern Pittsburgh Mart, Inc., Berger Bldg., Pittsburgh, Pa. CD 7/22.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Smith Engr. & Constr. Co.,** W. Pensacola St., Pensacola, Fla., CA, $577,050, earth embankment in swamp ground to make a form level foundation for planned extension of north-south runway and taxiway at Auxiliary Field No. 9, EGLIN AIR FORCE BASE, FLA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids July 22.

† **Bryne Constr. Co.,** 3316 Connecticut Ave. N.W., Wash., D. C. and **Industrial Associates,** 1726 Sansom St., Phila., Pa. CA $552,520. joint venture. maintenance hangar, Alexandria Air Force Base, ALEXANDRIA, LA. U. S. Eng., Box 867, Little Rock, Ark. Barron Heinberg & Brocato, Alexandria, La., archts. CD 7/30, under CA.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,
McDade & McDade, Fulton, Ky. CA, $666,748. bit. con. surf. Class I 7.075 mi., Mayfield-Wingo Rd., F 146 (19), SP 42-288, Graves Co. CD 8/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Virgil Love, Point Pleasant, W. Va., LB $681,071. COURT HOUSE, POINT PLEASANT, W. VA. Mason Co., Point Pleasant, W. Va CD 11/17/53.

▲ **L. P. Cox Co.,** Sanford, N. C., CA $1,213,000. renovation of six WARD BLDGS. (barracks lane group). BUTNER, N. C. State Hospitals Bd. Control, Raleigh, N. C. Bids July 15. CD 7/20, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ind., Gary**—PLANT—Bids Asked—Union Drawn Steel Co., 2700 E. 5 Ave., steel drawing and fabricating plant, $1,000,000.

▲ **Mich., Livonia**—PLANT—Bids Asked—Fisher Body Div. General Motors Corp., General Motors Bldg., Detroit, 650,000 sq. ft. plant addn., $7,500,000, Argonaut Realty Div., General Motors Corp., General Motors Bldg., Detroit, engr.-archt. CD 5/11/54.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Bates & Rogers Constr. Corp.,** 600 W. Jackson Blvd., Chicago, Ill., CA, $2,989,155, excavating, grading, concrete work, etc.;
Ingalls Iron Works Co., Verona, Pa., CA, $1,155,009 furnishing, shop painting, delivering permanent structural steel for track elevation of Nickel Plate Railroad Track, FORT WAYNE, IND. City Bd. P. Wks., City Hall, Nickel Plate R.R. District, P. McKay, div. engr., Calhoun and N.P. tracks, Fort Wayne, Ind. Bids July 9, awarded July 27. CD 7/28, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Joseph Skilken,** 383 S. Third St., Columbus, O., CA, Approx. $10,000,000. Great Western Shoppers Mart, Inc., 100-store U-shaped, COMMERCIAL CENTER, in 3400 Block of W. Broad St., 5,000 auto parking capacity, COLUMBUS, O. Don M. Casto & Son, 42 S. 4 St., Columbus, O. C. Melvin Frank, 185 E. State St., Columbus, O. archt.

▲ **Greenway Construction Co.,** c/o Louis I. Simon, archt., 179 W. Washington St., Chicago, Ill., Own Forces, $1,800,000, three APARTMENT bldgs., 6400 N. Damen St., CHICAGO, ILL.

▲ **Glenwood Gardens, Inc.,** Glenwood and Ackley Sts., Wayne, Mich. Owner Builds. Est. $1,800,000. 157 duplex brick, frame HOUSES Ford, Ackley and Wayne Rd. section, WAYNE, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—BUILDINGS

▲ **Tex., Port Arthur**—WAREHOUSE, etc.—BA 8/17—Gulf Oil Corp., West Port Arthur, steel frame, package and grease warehouse and dock facilities. $2,000,000. Plans deposit $50. Stone & Pitts, 1872 Calder St. Beaumont, archts.-engrs., Landauer & Shafer, 4801 Lemmon St., Dallas, engrs. CD 3/22/51.

▲ **Tex., Houston**—SHOPPING CENTER—BA 8/26—Gulfgate Shopping Center, c/o Theodore W. Berensen and Ben McGuire, Bankers Mortgage Bldg., Part of Sec. 1, superstructure for 450,000 sq. ft. masonry main bldg. of shopping center, $4,500,000; 3 story bsmnt., masonry 200,000 sq. ft. shopping center (1st sect.) (to be occupied by Joske Bros.), $2,500,000. Extended date. Irving B. Klein & Assocs., 1317 Austin St., Houston and John Graham, Jr., Dexter Horton Bldg., Seattle, Wash., archt.-engrs. CD 7/13.

▲ **Mo., Kansas City**—SCHOOL—BA 9/2—Bd. Educ., c/o Dr. G. Dewey Smith, asst. supt., Library Bldg., junior high school, 23 and Garfield Sts., $2,300,000, Marshall & Brown, 1016 Baltimore St., Kansas City, Mo., archts., Wm. M. Icenhower, school engr. CD 3/6/53.

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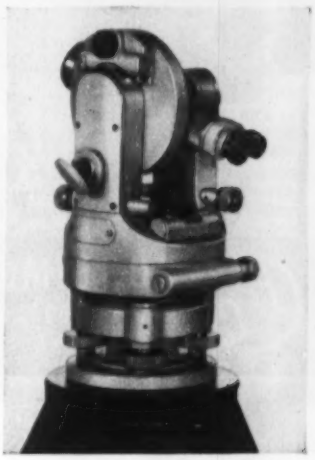

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HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Farnsworth & Chambers Co.**, 3018 Leeland St., Houston, Tex. CA, $2,194,911. 415,000 cu. yd. excav., 356,660 sq. yd. concrete apron paving 15 in. thick, 3,700 lin. ft. pipe culverts, storm drains, 42 to 66 in. diameter, portions of grid ducts, lighting, fueling sys. embedded in pavement, Little Rock Air Force Base, ENG-03-050-55-4, JACKSONVILLE, ARK. U. S. Eng., P.O. Box 867, Little Rock, Ark. Bids Aug. 3. CD 7/15.

BUILDINGS

LOW BIDS AND CONTRACTS

W. V. Roedter, 312 West Second St., Duluth, Minn. CA $582,015. general and mechanical contracts. grade SCHOOL, existing high school addn., REDLAKE, MINN. Bd. Educ., D. B. O'Rear, clk., Redland, Minn. CD 7/8, under LB.

▲ **Lovering Constr. Co.**, Guardian Bldg., St. Paul, Minn. CA est. $1,000,000. general contract, 2 story, 182,000 sq. ft. PLANT addn., ST. PAUL, MINN. American Can Co., 755 Prior Ave. N., St. Paul, Minn.

▲ **Olson Constr. Co.**, 410 S. 7 St., Lincoln, Neb., LB $1,227,000. Lefler Junior HIGH SCHOOL, LINCOLN, NEB. Bd. Educ., 720 S. 22 St., Lincoln, Neb. Bids July 22. CD 7/15.

Huntleigh Corp., 11257 Memorial Dr., Houston, Tex., Own Forces. $338,500. thirteen 1 and 2-story masonry DWELLINGS; $342,175, 9 solid masonry, rambling type dwellings, 2½ mi. west of Post Oak Rd., HOUSTON, TEX. CD 7/21.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., Los Angeles**—SCHOOL—BA 8/27—Los Angeles City School Dist., 1425 S. San Pedro St., Gardena High School Plant, 23 bldgs., Gardena, $3,500,000. H. L. Gogerty, 3123 W. Eighth St., Los Angeles, archt. CD 2/27/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Duncanson-Harrelson Co., 530 W. Cutting Blvd., Richmond, Calif. and **Pacific Bridge Co.**, 256 Montgomery St., San Francisco, Calif. CA $3,017,427. bridge and approaches, 2,863 ft. long bridge will provide two 40 ft. roadways, separated by 6 ft. median and off-ramp roadway 16 ft. wide, at Richardson Bay on U.S. 101, Marin Co. ml. north of San Francisco. CD 7/29, under LB.

▲† **Cen-Vi-Ro Pipe Corp.**, Southgate, Calif. LB $1,376,755. est. 1,412,773. constr. earthwork pipe lines, structures incl. 8 pumping plants, Central Valley Proj. Spec. DC 4194, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Bids July 29. CD 6/18.

BUILDINGS

LOW BIDS AND ONTRACTS

▲ **E. Moss**, 2720 E. 55 St., Seattle, Wash. Day Labor. est. $1,200,000. 65 HOUSES, MERCER ISLAND, WASH.

▲ **Long & Needham**, P. O. Box 1623, Fresno, Calif., LB $1,017,700, HOSPITAL ADDNS., FRESNO, CALIF. St. Agnes Hospital, 1451 North Fruit Ave., Fresno, Calif., Bids July 22. CD 7/20.

▲ **Robert E. McKee Inc.**, 4700 San Fernando Road, Los Angeles, Calif., LB $1,948,000, Woodrow Wilson Junior High SCHOOL, GLENDALE, CALIF. Glendale Unified School Dist., 411 E. Wilson St., Glendale, Calif. Bids July 29. CD 7/8.

▲ **Bishop-Younger-Bradley Co.**, 405 Sansome St., San Francisco, Calif., LB $1,364,900, TB WARD ADDNS., at Napa State Hospital, IMOLA, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif.

▲ **McDonald Bros.**, 6060 W. Adams Blvd., Los Angeles, Calif. CA, $2,077,777. Airport Junior High SCHOOL, LOS ANGELES, CALIF. Los Angeles City School Dist., 1425 S. San Pedro St., Los Angeles, Calif. Bids July 23. CD 7/7.

▲ **MacDonald Young & Nelson**, 351 California St., San Francisco, Calif., CA $1,159,800, OFFICE, SAN FRANCISCO, CALIF. Pacific Mutual Life Insurance Co., 660 Market St., San Francisco, Calif. Bids June 29, awarded July 29. CD 7/15, under LB.

▲ **E. H. Moore & Sons**, 693 Mission St., San Francisco, Calif., CA $1,309,600, John Muir Junior High SCHOOL, SAN LEANDRO, CALIF. San Leandro Unified School District, 451 W. Joaquin Ave., San Leandro, Calif. Bids June 8, awarded July 10. CD 6/15, under LB.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bathe & McLellan**, 81 King St. W., Oshawa, Ont., CA, $1,525,000, 6 story, bsmnt., 76x168 ft., rein.-con., brick, stone HOSPITAL WING, OSHAWA, ONT. Oshawa General Hospital, Oshawa, Ont. Bids July 23. CD 7/9.

▲ **Redfern Construction Co. Ltd.**, 36 Toronto St., Toronto, Ont., CA, $9,500,000, 1 story 800x1,400 ft. steel frame, brick, WAREHOUSE, Barrie Hwy. and Sheppard Ave., TORONTO, ONT. T. Eaton Co. Ltd., 190 Yonge St., Toronto, Ont. Bids July 26, awarded July 28. CD 7/14.

Nimbus Power Plant completion, Calif.

At 5% under the engineer's estimate, Stolte, Inc. of Oakland, Calif., received a $227,789 contract to complete the Nimbus Power Plant started in 1952. Six contractors sent in bids to the Bureau of Reclamation at Folsom, Calif. The plant is 15 miles northeast of Sacramento. It is 120 feet long, 91.5 feet wide and 99 feet from the foundation to the roof deck. Two generating units are 7,500 kva each. L. N. McClellan of Denver, Colo., is chief engineer.

The structure is part of the huge Central Valley Project. Work covers completion of the installations of machinery, equipment, and other metalwork for the existing power plant structure, cable control tunnel, and transformer areas; and the closure of 18-ft diversion openings in two 40-ft width gated blocks of the weir adjacent to the power house. While the closure is being made, the contractor must maintain a minimum downstream flow of 250 cfs for spawning salmon.

Although the total difference between the two low bidders was $8,411 or 4%, they were $34,054 and 41% apart on the lump sum item for installing non-embedded turbine parts and testing two 9,400-hp turbines.

Materials furnished by the government include: special tools; all structural steel gratings, bolts, nuts, washers, and locknuts; insulated electrical wires and cables; lighting fixtures.

Following are minimum wages: $2.725 per hour for painters, $3.00 for structural ironworkers, $3.35 for cable splicers, $3.00 for electricians, $2.27-$3.10 for power equipment operators, $2.00 for common laborers.

Completion time to generate and transmit power from the first generator is 120 days; from the second, 180 days; remaining work, 250 days. Liquidated damages are $300 per day on each generator, $100 on the rest.

Bidders include:

1C	Stolte, Inc., Oakland 21, Calif.	$227,789
2	Wismer& Becker & Assoc., Sacramento, Calif.	236,200
6	Commonwealth Electric Co., Lincoln, Neb.	289,944
EE	Bureau of Reclamation, Folsom, Calif.	240,039

Bids: 6-2-54 Item	Unit	Quantity	Unit Prices 1 C	2
Install:				
Non-embed turbine pts & test 2-9,400 hp turbe	ls	1	$49,000	$83,054
& tst 2-213,500 ft-lb govs for hydr turbs	ls	1	6,300	5,285
Motor-dr centrif water pump units	lb	1,800	0.55	0.22
Motor-dr gear oil pumps	lb	1,000	0.34	0.18
Pneum sew ejectors	lb	1,250	0.40	0.16
Air compres & recv	lb	6,000	0.09	0.12
Water-level gages	ls	1	113.00	39.00
Port fire ex & hose	ls	1	$350.00	$158.00
Equip, fire hs cabinet	ea	2	50.00	9.00
CO_2 fire ex sys, oil rms, & test	ls	1	945.00	1,368
Water treat equip	lb	4,000	0.21	0.11
Name plates on hydr equip	ea	200	2.74	3.10
Filter-paper dry oven	ls	1	75.00	110.00
Erect steel structs	lb	2,000	0.11	0.09
Stl hndrl on pow plnt & dam	ls	1	4,300	4,881
Serv htch cov & frbay still well platf	ls	1	850.00	878.00
Gener htch cov, insulate	ls	1	4,500	3,136
Met safety tread	ls	1	200.00	231.00
Elec wire, 600v ins, singl cond, AWG No.:				
12	lf	17,400	0.055	0.04
10	lf	1,400	0.08	0.055
8	lf	2,100	0.09	0.08
6	lf	300	0.17	0.20
4	lf	900	0.20	0.10
2	lf	8,000	0.17	0.10
1	lf	750	0.22	0.16
2/0	lf	300	0.22	0.20
4/0	lf	200	0.34	0.42
Contrl cble No. 19/25 AWG, 600v ins:				
2-conductor	lf	2,800	0.22	0.10
3-conductor	lf	2,200	0.25	0.13
4-conductor	lf	700	0.26	0.15
7-conductor	lf	900	0.28	0.26
9-conductor	lf	600	0.31	0.32
Contrl cble 600v ins 19/22, 4-conductor	lf	1,400	0.28	0.17
Contrl cble 600v ins No. 6 2-conductor	lf	700	0.31	0.10
Shield pow cble 7,500v ins 1/0 AWG	lf	400	1.35	2.33
600,000 circ mil	lf	120	3.35	1.70
Main pow cables	lf	3,050	1.56	1.24
Line contrl bd C1A	ea	1	470.00	414.00
Supv contrl cabinet C2B	ea	1	400.00	299.00
Oil room CO_2 cab C1C	ea	1	400.00	102.00
"Start-Stop" psh-btn swch, pow plant area	ea	8	22.00	19.00
Psh-btn sta, spilwy	sta	18	16.50	47.00
Float switches	ea	2	11.00	28.50
Pressure swch	ea	4	11.50	37.50
600kva substa w 2 transfrm & discon swch	ls	1	1,200	1,814
3-phs 75kva lt trfr w 3-phs 7.5kva in v reg	ls	1	300.00	240.00
Contrl cent dist brds & lt distrib brd	ls	1	700.00	674.00
DC circ break dist brd	ls	1	350.00	52.00
Motor startrs II & under	ea	2	11.00	30.50
Sta stor bttry	ls	1	825.00	716.00
Contrl brd, spilwy area	ea	5	146.00	87.00
Light fixt, spilwy area	ea	18	22.00	14.00
Gener-v swchgr, 2 sets	ls	1	1,200	2,339
Gener-neut grnd equip 2	ls	1	600.00	557.00
Pow transformer "KVA"	ls	1	3,300	2,355
115kv air swch, auto oper	ls	1	600.00	372.00
Furnish & place:				
Cble tray & pow cble supp	ls	1	7,000	10,365
Misc indic instrum	ea	11	39.00	17.20
Stl hndrail, wallrl, ladd in pow plant	ls	1	3,400	4,173
Floor & cov plate, grates, oil htch cov	ls	1	1,400	1,594
Chain link fence	lf	130	7.00	7.20
Flush hol met sw door	ea	1	4,000	2,471
Tin-clad fire doors	ea	1	200.00	430.00
Access doors	ea	1	200.00	304.00
Met toilet stll & urin	ea	1	200.00	244.00
MP, fit & vlv und dia 2½"	lb	22,500	0.79	0.58
ov dia 2½"	lb	15,000	0.65	0.47
Strainers	ea	2	1,100	990.00
Flang lubr plug vlv	lb	1,600	0.80	0.66
Pipe hangers & supprts	lb	4,000	0.67	1.17
Plumbing fixt, f&p	ls	1	700.00	608.00
Heat & vent sys	ls	1	15,000	8,865
Grnd conn to 2 generators	ls	1	1,600	368.00
Elec rig met conduit ½"	lf	60	2.25	3.30
¾"	lf	360	1.70	2.53
1"	lf	320	1.90	1.95
1½"	lf	2,270	2.80	1.40
2"	lf	50	4.50	2.04
3"	lf	120	3.35	5.00
6"	lf	120	2.25	1.80
600-v switchbd wire	lf	500	0.17	0.67
Copper tube, IP-size 1¼"	lf	70	5.50	4.67
3"	lf	40	11.50	19.35
Bare strnded cop cble 4/0	lf	150	1.12	1.54
500,000-circ mil	lf	60	1.65	3.60
Susp insul asemb	ea	3	34.00	38.35
Extens strap asemb	ea	3	11.00	10.00
SS ped ins asemb, 7,500v	ea	6	34.00	13.17
115,000v	ea	9	191.00	138.67
Light sys, transf area & tunnel	ls	1	1,200	323.00
Station signs	ea	8	23.00	10.00
Bond-conc fin on floors	sy	1,900	7.20	7.10
steps	sy	100	12.70	9.20
Painting generators	ea	2	900.00	900.00
Make panel cutouts, elec	sl	200	0.50	0.93
Close for divers opengs	ls	1	33,000	27,976

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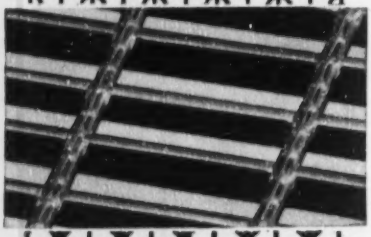

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West Coast lumber strike: It hasn't hurt very much yet

Though prices on lumber and plywood are up sharply, there have been few cutbacks. But homebuilders worry.

The strike in the Northwest lumber and plywood mills, now in its eighth week, has done very little as yet to slow construction work by general contractors and homebuilders. In most places, contractors have built up adequate stockpiles of lumber to finish current jobs, or are relying on lumber from mills not on strike. Generally, the contractors believe they can continue to work without interruptions even if the strike goes on for a long time. These are the general conclusions you can draw from an ENGINEERING NEWS-RECORD coast-to-coast survey.

Naturally, the strike complicates the estimating problems of general contractors on lump-sum contracts, since the future course of lumber prices is uncertain. If the strike continues, prices may go up. On the other hand, an early settlement could mean a fast drop in prices. That's why contractors are protecting themselves against price changes wherever possible.

Homebuilders are in something of a squeeze. For in spite of the current boom in homebuilding, the market is gradually getting more competitive. In many parts of the U. S. profit margins are narrowing, and builders are increasingly hesitant about boosting prices. This shows up in several places surveyed by ENR.

The only sector of the construction industry that is feeling the strike is composed of contractors who specialize in remodeling and repairs. There is no doubt that clients are holding off until the strike settles and prices return to normal.

Here's a rundown on the situation in some key areas:

• **Boston**—In the Boston area, general contractors say there is plenty of lumber. They are paying perhaps 5% more than two months ago for some items, and are refusing to pay asking prices that have been upped 5% to 35% on form plywood, and 10% to 25% on framing lumber. Actually, the after effects of the cement strike, which was settled about three weeks ago, are causing them more trouble than the Northwest lumber strike.

However, some homebuilders are paying 20% more for lumber. Some of the smaller ones are beginning to hesitate about new starts. An increase of $300, say, in framing costs is enough to bother homebuilders in this region.

• **Philadelphia**—Nearly all Northwest lumber has been arriving here by rail instead of boat since the strike started, and that has boosted costs. Droves of Southern lumber salesmen have come in and are selling plenty of lumber. Northwest lumber is now up about $20 to $25 per Mftbm since the strike began. Southern pine is up $10 to $15. There are signs that builders may continue to use Southern pine wherever possible after the strike is over.

If the strike continues much longer, estimates are that construction of up to 8,000 homes may be stymied. General contractors say that they are figuring all jobs on an elastic basis to allow for future changes in costs.

• **Atlanta**—The strike of Building Trades Council workers has been holding up work here, anyhow. But the boost in lumber prices is bothering homebuilders, who say they can't pass the extra cost along.

One big homebuilder says he is about 20% behind schedule due to the lumber strike. He is using top-grade Southern pine as a substitute and that's gone up $15 per Mftbm. He expects to cut back on building if the strike continues.

• **Miami**—Prices are up, and plywood is very hard to find at any price. For instance, No. 1 2x4s are selling at $125 to $130, compared with $110 before the strike.

However, no one is cutting back work. Though plenty of lumber is used here, most construction is of concrete block and stucco.

• **Cleveland**—Local observers believe that construction activity here is lower than was expected earlier this year. At any rate, there is a fair sup-

ply of lumber. One lumber dealer even reports that business is slow.

• **Chicago**–Building contractors here haven't started to cut back, but may have to if the strike continues. Lumber shipments into this area are only 40% of normal. Lumber prices are up from 15% to 20%, and plywood is up about 10%.

• **Milwaukee**–At the start of the strike, some dimension lumber here went up as much as $21 per Mftbm. But since then, prices have leveled off. Lumber prices are now between $15 and $18 higher than when the strike began. Most large contractors carrying a stock of lumber are biting into that and holding down on purchase of more. They said they had no trouble getting any lumber they needed.

One lumber dealer reports that some firms are substituting hemlock and Canadian spurce for Douglas fir. That would bring lumber costs down to the pre-strike level.

• **St. Louis**–No cutbacks here, either. Contractors here point out that substitute materials could easily be used if there is a pinch.

• **Kansas City**–Lumber dealers are in good shape, and many are not rebuilding inventory. They are afraid of getting caught with high-priced lumber when the strike ends. Prices are up 10% to 20%, which is lower than they were soon after the start of the strike.

• **Omaha**–No cutbacks here except for repairs and remodeling work. However, both lumber and plywood are starting to get scarce. Lumber dealers have been keeping up inventory by buying from the so-called "woodpecker" mills, the small mills which they usually ignore.

"We always call around and trade back and forth in an emergency," says one local contractor. "And I've had no calls yet."

• **West Coast**–Out on the West Coast itself, the strike hasn't curtailed construction, possibly because many contractors stocked up on lumber before the mills shut down. Green lumber is readily available from small non-union mills, but kiln-dried lumber is very short since this comes from the larger mills. According to a report from the Southern Pacific Railroad, lumber car loading is about 75% of normal, and nearly all of the lumber is green.

Some mill men have returned to work under so-called "sweetheart" settlements, which give workers any general raise which occurs when the strike is settled. At Medford, Ore., the Medford (Ore.) Veneer & Plywood Corp., announced adoption of a novel formula which gives workers a 5 cents per hour bonus if plywood sells for $85 per Mftbm in any month, and 7½ cents if it rises to $90.

In California, Bay Area carpenters pledged their aid to striking sawmill workers and said they won't work on jobs where lumber from struck mills is used. However, so far there are no instances of lumber coming in from struck mills.

Architect-engineers did big business

There were 408 architect-engineer firms in 1953 who took on $100,000 or more of new business, according to ENR's annual survey. They signed up 2,165 projects with a total value of $2,459 million.

This is the first time ENR has surveyed separately the new business taken on by firms which are in both architecture and consulting engineering. Previously, such firms were included in ENR's surveys of new business by engineers and by architects.

By comparison, there were 1,195 firms last year which were consulting engineers exclusively and which took on at least $100,000 of new business (ENR July 15, p. 80). They handled 4,863 projects with a total volume of $4,745 million. Firms whose business was strictly architectural, and who did $100,000 or more in new business last year, totaled 3,134 (ENR July 22, p. 63). They took on 7,734 projects with a total volume of $6,799 million.

As might be expected, most architect-engineer firms are in the $1-million-plus class. And the firms in this top group garnered nearly all the business taken on by architect-engineers last year.

It isn't surprising, either, that most of these double-barreled firms are more interested in the building field than in heavy construction. However, a sizable number of these outfits took on new work last year in every category of non-building construction.

(*B & F continued on page 102*)

Architect-engineer new business in '53—by size of firm and type of work

Type of work	Size by dollar volume of new business									All architect—engineers		
	1—$1,000,000 or more			2—$500,000-$1,000,000			3—$100,000-$500,000					
	Number of firms	Number of projects	$ volume (millions)	Number of firms	Number of projects	$ volume (millions)	Number of firms	Number of projects	$ volume (millions)	Number of firms	Number of projects	$ volume (millions)
Heavy construction												
Waterworks	51	137	$61.0	2	4	$0.5	12	12	$1.5	65	153	63.0
Sewerage	56	141	52.9	1	1	0.1	12	12	1.7	69	154	54.7
Bridges	11	19	103.8	0	0	0.0	2	3	0.2	13	22	104.0
Highways	33	48	69.2	2	2	0.2	5	5	0.9	40	55	70.3
Earthwork, waterways	21	21	32.7	2	2	0.1	2	2	0.2	25	25	33.0
Airports	57	149	161.0	11	21	3.8	7	7	0.8	75	177	165.6
Unclassified	69	132	161.8	14	16	3.0	9	12	1.7	94	160	166.5
Total	...	647	642.4	...	46	7.7	...	53	7.0	...	746	657.1
Buildings												
Industrial	102	293	520.3	22	30	7.5	24	36	5.0	148	359	532.8
Mass housing, commercial and public buildings	228	944	1226.3	51	86	33.0	32	30	10.0	311	1060	1269.3
Total	...	1237	1746.6	...	116	40.5	...	66	15.0	...	1419	1802.1
Federal (incl. in above)	83	164	252.3	11	23	4.7	9	10	1.4	103	197	258.4
All construction	**266**	**1884**	**2389.0**	**67**	**162**	**48.2**	**75**	**119**	**22.0**	**408**	**2165**	**2459.2**

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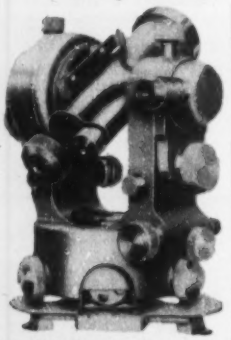

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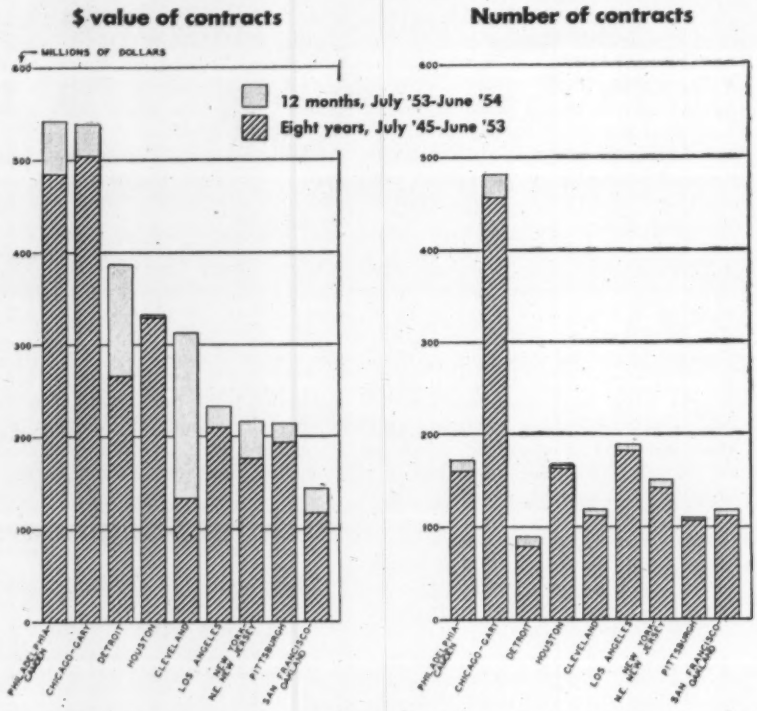


Chart by Territorial Information Office, Commonwealth Edison Co., Chicago ,Ill. Based on contracts for factory construction costing $100,000 or more, reported by ENR; excl. equipment.

Factories are sprouting all over

The chart (above), compiled by the Territorial Information Department of Commonwealth Edison Co., Chicago, from ENR's awards for manufacturing construction, shows the relative industrial expansion of major metropolitan areas since World War II.

The Philadelphia-Camden area, heart of the fast-expanding Delaware Valley (ENR June 3, p. 30) led all other metropolitan areas for the nine-year period from July 1, 1945, to June 30 of this year. About $300 million of the area's total of $540 million is accounted for by construction of the U. S. Steel Corp. plant at Morrisville, Pa.

Just behind Philadelphia comes the Chicago-Gary area. Chicago is far ahead of all other metropolitan areas in number of contracts. This is true both for the nine-year period and for the year ending June 30.

• **Fast growth**—It is interesting to note the fast growth of awards in Detroit and Cleveland during the past year. Both were caused by large single contracts—$100 million for a steel mill expansion by McLouth Steel Corp., near Detroit, and $160 million for engine and stamping plants at Cleveland for Ford Motor Co.

• **Charging perspective**—The perspective as to which is the leading part of the U. S. for factory expansion changes rapidly, depending on whether you make your examination of factory awards on the basis of metropolitan area, state, or region.

The study shows that Texas continues to lead all other states in industrial expansion, with a total contract value of over $1.5 billion. This expansion continues to be primarily in the petroleum and chemical fields. Pennsylvania is a distant second with about $800 million in awards.

Among U. S. regions, the central region (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) is far ahead of all others. Its total is about $3.1 billion for the nine-year period. That is about one-third of the total postwar factory expansion in the U. S. For the year ending June 30, the central states were found to have more than one half of total factory awards.

Highway financing plans due for state debate

Proposals designed to provide additional revenues to finance free highway construction programs will be introduced in more than 30 of the 44 regular state legislature sessions scheduled to convene next year, according to a survey of state capital opinion.

In 21 states, there are already indications that financing proposals including increased highway-user taxes or bond issues will be given legislative consideration. In eight states, there will be new tries for higher gasoline and truck taxes; and still others almost certainly will consider some form of financing legislation.

Although comparatively few legislatures convened in 1953, proposals for bond issues or other forms of borrowing that would finance free highway construction got initial or final legislative approval in Colorado, Kentucky, Louisiana, Massachusetts, Mississippi and New York. A gasoline tax increase was enacted in New Jersey—but not for road purposes, and in Colorado, the state will get additional revenue from trucks by changing existing mileage taxes from cargo to gross ton-mile basis.

Business boost: loans supply cash for construction

At least $15 million worth of construction has been backed so far this year through loans approved by the Small Business Administration, successor agency to the Reconstruction Finance Corp.

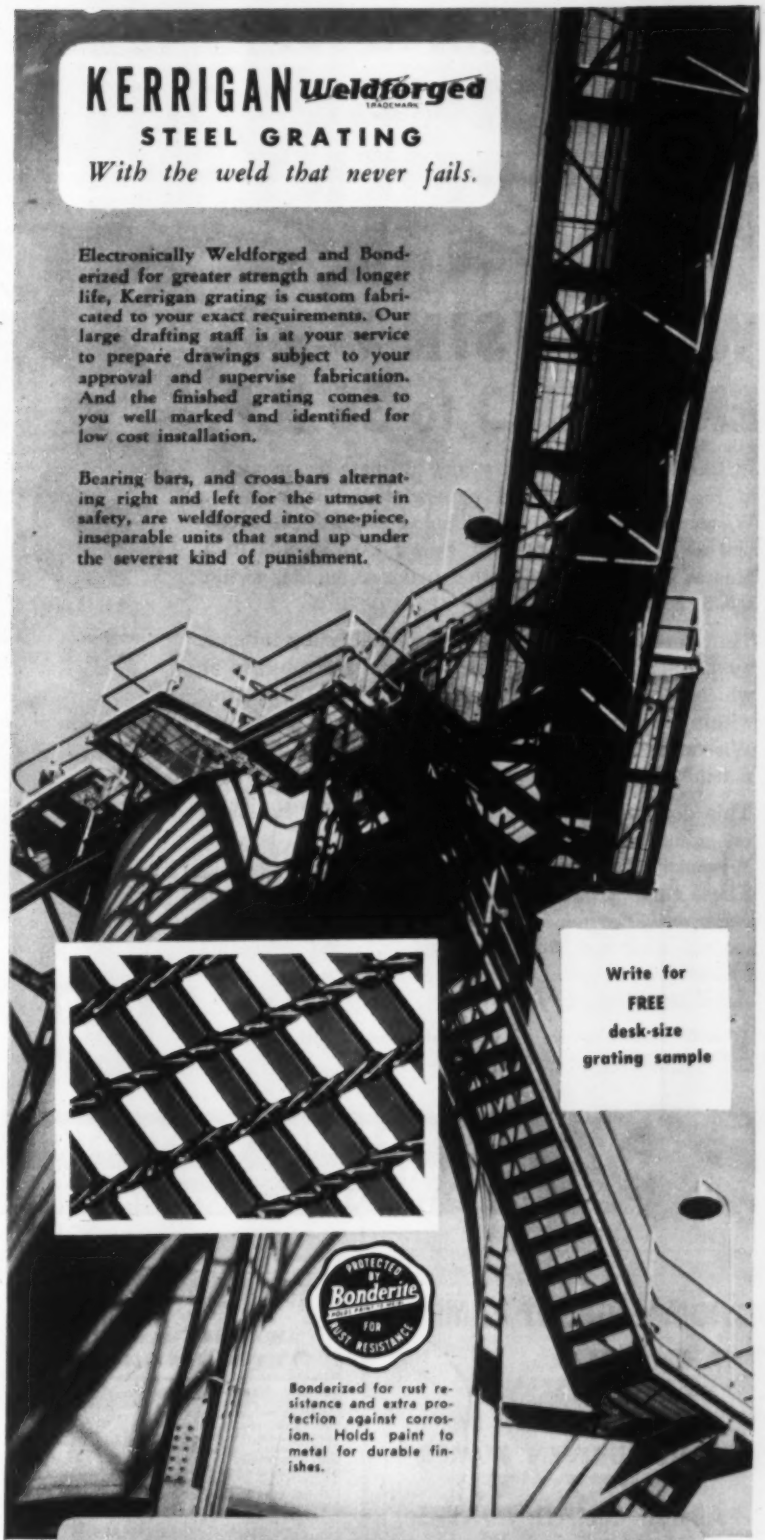
Since SBA's lending program has shifted into high gear lately, you can look for a spate of additional new construction financed by government loans to small firms, in months to come.

The agency still has a fund of about $47.7-million from which to make small business loans. About 350 loan applications are now made monthly. On the average, SBA approves a quarter of them—amounting to $60,000 each.

Since the turn of the year, SBA has approved 553 loans, amounting to $32.3 million. According to the agency's vague classification, the purpose of most loans is to provide "working capital." But officials estimate that roughly half the funds are used for the purpose of new construction or additions and improvements to existing buildings.

The bulk of SBA loans are made

(*Continued on page 104*)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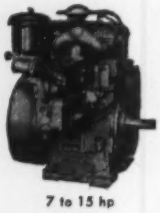
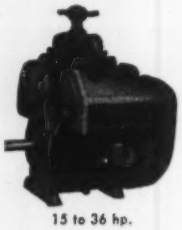


7 to 15 hp



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jointly with local banks. Only 188 direct loans have been granted, totaling $9.9 million. The remainder are participation loans, in which the government puts up no more than 90% of the money, a local bank the rest. SBA puts up its share immediately, or agrees to buy its part of the loan from the bank on demand at any time.

Business briefs . . .

• **Work-put-in-place** hit a new high for July of $3.5 billion, according to estimates by the Commerce and Labor Departments. This was 5% above June and 6% above July 1953. So far this year, estimated work in place totals about $20 billion, more than half a billion dollars above the same period last year.

• **Expansions:** B. Perini & Sons, Inc., of Framingham, Mass., has purchased Bay State Dredging & Contracting Co., of Boston. And Chicago Pump Co., of Chicago, maker of sewage treatment and disposal equipment and specialty pumps, has been acquired by Food Machinery & Chemical Corp., of San Jose, Calif. Chicago pump will continue under its present management as part of FMC's Peerless Pump Division.

• **A corporate joint venture** for bidding on all phases of the Seaway has been formed by six leading Canadian contractors. The companies: Angus Robertson, Ltd.; Foundation Co. of Canada; Pentagon Construction Co.; Rayner Construction, Ltd.; Canadian Comstock Co.; and Rayner & Armstrong, Ltd. The last two firms are specialist contractors.

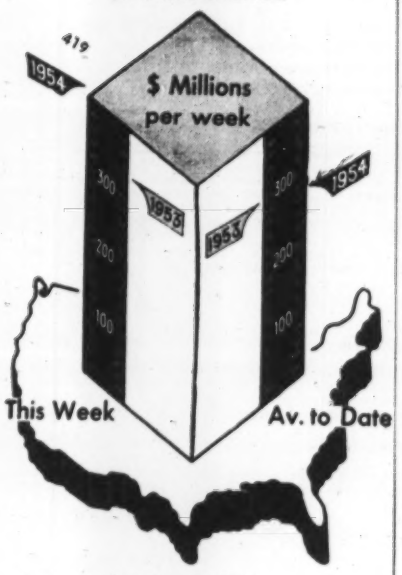
• **New York Thruway traffic** on the initial 115-mi stretch opened in June has exceeded estimates "by a comfortable margin," says Thruway Chairman B. D. Tallamy.

• **Keen competition** has been responsible for cutting the work backlog of Arthur G. McKee & Co. from $62 million at the start of this year to $50 million at midyear, according to the company's first-half report. Since then, the company has received an order to build a large blast furnace and related facilities in Argentina.

• **Easy money market** has caused the Housing & Home Finance Agency to cancel two college housing loans it had previously approved. The colleges were able to sell their bonds at a lower rate than the 3¼% by HHFA.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 32 wks 1954	1953	% chge
Federal	$16.6	$779.4	$993.8	−22
State and municipal	133.9	3,012.4	3,030.3	−1
Total public	150.5	3,791.8	4,024.1	−6
Total private	268.7	5,074.7	5,471.1	−7
U. S. total	$419.2	$8,866.5	$9,495.2	−7

Contracts by type of work

Waterworks	$2.9	$136.6	$147.7	−8
Sewerage	5.1	234.4	250.0	−6
Bridges	22.2	301.6	374.2	−19
Highways	67.5	1,145.5	1,116.1	+3
Earthwork, Waterways	1.6	169.7	255.5	−34
Buildings: Public, excl. hsg.	35.3	1,101.6	1,062.0	+4
Housg., pub.	0.6	155.4	284.9	−45
Housg., priv.	43.1	2,664.8	2,353.9	+13
Commercial	40.2	788.5	796.7	−1
Industrial	23.0	1,216.5	1,712.3	−29
Unclassified	177.7	952.9	1,141.9	−17
Total	$419.2	$8,866.5	$9,495.2	−7

NOTE: Minimum size projects included are: Waterworks and waterways $34,000; other public works $60,000; industrial buildings, $82,000; other buildings $300,000.

New capital for construction

(millions of dollars)

	Week of Aug. 5 1954	Cumulative 31 Wks 1954	'53-'54 % chge
Corporate securities	$6.0	$1,902.8	−28
State and municipal: All except housing	61.8	3,407.9	28
Housing	*	69.9	−67
Federal loans	...	75.8	−9
Federal aid	...	630.0	234
Total non-federal	$67.9	$6,086.4	5
Federal approps.: In U. S.	...	1,126.0	62
Outside U. S.	...	28.4	...
Total new capital	$67.9	$7,240.8	12

* Less than $500,000.

ENR cost and volume indexes, 1954

		Base years = 100 1913	1926	1949
Construction cost	8/5	641.58	308.41	134.50
	7/29†	642.05	308.63	134.60
Building cost	8/5	455.07	246.00	129.36
	7/29†	455.51	246.23	129.48
Volume	July	547	222	158
	June	510	207	147

† Official ENR indexes for Aug. 1

For additional cost index data, see Construction Daily

OFFICIAL PROPOSALS

Bids: September 15, 1954

Construction of Water Pumping Station and Appurtenant Work

CITY OF WORCESTER
DEPARTMENT OF PUBLIC WORKS

Sealed bids for constructing High Service Pumping Station and appurtenant work will be received at the office of City Manager, Room 306, City Hall, Worcester 8, Mass., until 10 a.m. Eastern Daylight Saving Time on September 15, 1954 and at that time publicly opened and read.

Drawings and contract documents may be examined at the Office of the Commissioner of Public Works, 20 East Worcester Street, Worcester, Mass., and examined and obtained at the office of Metcalf & Eddy, Engineers, 1300 Statler Building, Boston, Mass. Ten dollar deposit required. A surety company bond securing faithful performance and covering the provisions of General Laws Chapter 149-S29 will be required. Proposal guarantee of a $10,000 certified check will be required with the bid. Minimum wage rates under C461 of Acts of 1935 have been determined. The Contractor will be bound by the applicable statutory provisions of law. The location of this work may be inspected. The City reserves the right to reject any or all bids. Mark envelopes: "Proposal for Constructing High Service Pumping Station Contract 6."

CITY OF WORCESTER
By
Earl R. Perry
Commissioner of Public Works

Bids: September 9, 1954

General Construction of High School

Rogers High School
Newport High School Commission
Newport, Rhode Island

Separate sealed bids for the general construction of the Rogers High School, Newport, Rhode Island, including all items of the Proposal, will be received by the Newport High School Commission at the office of the Superintendent of Schools, City Hall, Newport, Rhode Island, until twelve o'clock noon, Eastern Daylight Saving Time, Thursday, September 9, 1954, and then at said office publicly opened and read aloud.

Separate sealed bids for subcontract amounts under Item 2 of the Proposal will be received at the same office and will be mailed or delivered concurrently to all general bidders at twelve o'clock noon, two days prior to the date for receiving bids noted above, on the following Divisions of the work:

Division No. 10—Metal Windows and Subframes
Division No. 11—Porcelain Wall Panels and Wall Insulation
Division No. 13—Roofing, Sheet Metal and Roof Insulation
Division No. 19—Floor and Wall Tile
Division No. 31—Painting and Decorating
Division No. 32—Sprinklers
Division No. 33—Plumbing and Drainage
Division No. 34—Heating and Ventilating
Division No. 35—Electrical Work

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Bond Forms may be examined at said office, and copies thereof may be obtained at said office or at the office of the Architects, Kelly & Gruzen, 73 Tremont Street, Boston, Massachusetts, on or after August 11, 1954, on payment of One Hundred Dollars ($100.00) in the form of a certified check made payable to the Newport High School Commission for each set. Any bidder or non-bidder, upon returning such set promptly and in good conditions, will be refunded his payment in full.

The Newport High School Commission reserves the right to waive any informalities in or reject any or all bids.

Each bidder must deposit with his bid a certified check as security in the amount of not less than two percent (2%) of his bid for general bidders, and not less than three per cent (3%) of his bid for registered sub-bidders, subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and wage rates to be paid under the contract.

No bidder may withdraw his bid until thirty (30) days after the actual date of the opening thereof.

NEWPORT HIGH SCHOOL COMMISSION
Paul F. Murray, Secretary

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Official Proposal Division

ENGINEERING NEWS RECORD
Address: New York 36, N. Y.

Bids: August 31, 1954

Lincoln Tunnel Bus Parking Lot F

THE PORT OF NEW YORK AUTHORITY
CONTRACT LT-110.014

Sealed proposals for the construction of a bus parking lot on the south east corner of West 40th Street and 11th Avenue in New York City will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 31, 1954, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4222) will be received at Denver, Colorado, until September 2, 1954, for furnishing three (3) float-operated radial-gate hoists for the spillway at Webster Dam, Solomon Division, Webster Unit, Kansas, Missouri River Basin Project. Delivery is desired within 365 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: August 19, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 19th day of August 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Albany, Essex, Greene, Rensselaer, Saratoga; Schenectady, Warren; Washington	R.C. 54-92	Br. S.H. 9109; Br. No. 2 S.H. 5311; Br. No. 3 S.H. 8309; Br. No. 1 S.H. 490; Br. No. 1 S.H. 285; Br. No. 2 S.H. 1521; Br. No. 2 S.H. 439; Br. S.H. 240; Br. S.H. 1172; Br. No. 1 S.H. 8485; Br. No. 1 S.H. 721; Br. P.S.C. 1177, S.H. 1224	....	Cleaning & Painting 12 Bridges	$1,600 Plans $10	$29,000
Albany	FAC 54-8	Albany City: Riverfront Arterial Highway (Cont. 1) Project U-712(5)	0.71	9" Cem. Conc. Pavt. 2 @ 24' Wide=0.44 Mi. Misc. Work=0.27 Mi.	$70,000 Plans $15	1,297,000
Saratoga	US-87	Locks 2, 3, 4, 5, & 6 (Barge Canal)	....	Lowering the Sills Extending the Upper Gates & Other Misc. Work	5% of Bid Plans $15	Not Published
DISTRICT No. 2; L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Montgomery	FASS 54-14	Fort Plain-St. Johnsville (CR 65) Proj. S-420(1)	0.33	Asph. Conc. Opt. Pl. Girder Br. 4 Spans 3 @ 120', 1 @ 233'	$36,000 Plans $15	652,000
DISTRICT No. 3, William Robinson, District Engineer, Weigh Lock Bldg., Syracuse, N. Y.						
Onondago, Oswego, & Seneca	R.C. 54-91	Br. No. 1 S.H. 5042; Br. No. 1 S.H. 5274A Br. No. 1 S.H. 278	....	Cleaning & Painting 3 Bridges	$1,100 Plans $10	20,000
DISTRICT No. 4; E. G. H. Youngmann, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Genesee & Monroe	O.T. 54-4	New York State Thruway—Ontario Section—Subd. 6A & 6B (Leroy Gas Station—Restaurant Site)	....	Grading, Paving & Misc. Work	$9,500 Plans $10	173,000
Ontario	O.T. 54-3	New York State Thruway—Ontario Section—Sub. 15 (Clifton Springs Gas Station—Restaurant Site)	....	Grading, Paving & Misc. Work	$12,000 Plans $10	204,000
DISTRICT No. 5, C. R. Waters, District Engineer, State Office Building, Buffalo, N. Y.						
Erie	FAC 54-9	City of Buffalo: Fuhrmann Blvd. (High Level Bridge Apps.). Proj. U-750(6) Cont. 4	1.38	Asph. Conc.	$30,000 Plans $15	564,000
Erie	FASS 54-12 FARC 54-88	Mile Strip Road C.R. 460 Lake Shore-Lackawanna City, S.H. 5019. Proj. S-366(1)	0.90	9"-2 Crse. Cem. Conc. Pavt.=0.31 Mi. Asph. Conc. Opt.=0.59 Mi.	$13,000 Plans $10	232,000
Niagara	FAC 54-10	City of Lockport: Genesee Street-Walnut Street Project U-709(4)	(0.30) (Acc.) (0.32) (Hwy.)	Asp. Conc.=0.31 Mi. Asph. Conc. Acc.=0.26 Mi. Misc. Work=0.05 Mi. Comp. I-Beam Br. 133.5'	$65,000 Plans $25	$,174,000
Niagara	M 54-6	Pine St. Bridge E-232 Over Barge Canal at Lockport	....	Cleaning & Painting	$820 Plans $10	14,840
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Building, Hornell, N. Y.						
CHEMUNG	FARC 54-86	Fassett-Southport, S.H. 1561 Proj. F-479(10)	4.44	Asph. Conc. Optional	$52,000 Plans $25	945,000
CHEMUNG	FASH 54-15 FAC 54-11 FARC 54-89 FASH 54-16	Elmira-Lowman, S.H. 5207 Elmira-Horseheads Conn. Pt. 1 & 2 Elmira City: East Church St. Elmira-North Elmira Extension Horseheads-Montour Falls, S.H. 5208 Project U-221(5); U-479(11)	7.08	Asp. Conc. Opt.=5.14 Mi. 9" Cem. Conc. Pavt., Var. Wide=1.71 Mi. Misc. Work=0.23 Mi. 3 Brs., 2 Hy. Sep., 4 Comp. I-Beam, 212.3'/202.9'/206', 156'. 1 Twin Closed Box 2 @ 20.5'	$250,000 Plans $100	4,586,000
DISTRICT No. 7; R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
Lewis	FASSH 54-14	Kitts Corners-Naumburg Pt. 2 Project S-882(5)	1.17	Asp. Conc. Opt.=1.17 Mi. I-Beam Br. 7 Spans. Total 640'	$45,000 Plans $15	826,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia, Dutchess, Putnam, Ulster	R.C. 54-90	Br. No. 1 S.H. 827; Br. No. 3 S.H. 567; Br. No. 1 S.H. 5150; Br. No. 1 S.H. 5549; Br. No. 2 S.H. 5098; Br. No. 2 S.H. 5722; Br. No. 3 S.H. 5722; Br. B-1 S.H. 5705	....	Cleaning & Painting 8 Bridges	$1,000 Plans $10	18,000
Westchester	TSP 54-2	Taconic State Parkway (Hawthorne Traffic Circle)	....	Installing Electrical Lighting Facilities	$450 Plans $10	8,000
Columbia	TSP 54-8 RC 54-93	Taconic State Parkway Sect. 9B Pt. 2 (W. Taghkanic-Martindale) Hollowville-Craryville S.H. 763	10.70	Grading, Drainage and Structure 7.96 Mi. Asph. Con. Opt.=0.20 Mi. Cal. Chl. Treated Gravel=1.92 Mi. Cem. Conc. Pavt.=0.57 Mi. Misc. Work=0.05 Mi. Br. I-Beam—2 Spans 67.5' Ea. Hwy. Sep.-I-Beam—3 Spans 24.5', 53.25', 42.5', Hwy. Sep., Rigid Fr.—2 Spans 36.33' Each	$175,000 Plans $100	3,043,000
Rockland & Westchester	H.T. 54-1	New York State Thruway—Hudson Section—Sub. 9B (Tappan Zee Bridge & Approaches)	3.39	Electrical Facilities	$45,000 Plans $15	808,000
Rockland & Westchester	H.T. 54-2	New York State Thruway—Hudson Section—Sub. 9B (Tappan Zee Bridge)	3.00	Cem. Conc. Pavt. of Br. Deck Including Curbs & Malls=2.96 Mi. Misc. Work=0.04 Mi.	$225,000 Plans $50	4,080,000
Westchester	H.T. 54-3	New York State Thruway—Hudson Section—Sub. 9A (Tappan Zee Bridge—Tarrytown Approach; Access Ramps & Parking Lot)	1.81	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide=1.72 Mi. Asph. Conc. Opt.=0.09 Mi.	$35,000 Plans $15	617,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.						
Nassau	FASS 54-13	Peninsula Boulevard Cont. 3 Ocean Ave. Project S-319(3); S-395(1)	1.38	Asp. Conc. Optional Pedest. Overpass 137' Cont. Girder	$62,000 Plans $15	1,137,000
Suffolk	SMSP 54-2 R.C. 54-87	Sunken Meadow Spur Parkway Cont. 4 Smithtown-Fort Salonga Pt. 2 S.H. 1291	(1.16) (Acc.)- (1.25) (Hwy.)	Grad. & Drainage=0.61 Mi. 9" Cem. Conc. Pavt. 44' Wide=0.28 Mi. Asph. Conc. Opt.=1.52 Mi. 5 Hwy. Seps. Rigid Frs. 66.7', 66.1', 70.1', 84.1' & 46.7'. 1 RR Sep. Comp. I-Beam 105.1'	$100,000 Plans $50	1,938,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: August 19, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 19th day of August 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 5, C. R. Waters, District Engineer, State Office Building, Buffalo, N. Y.						
Chautauqua	E.T. 54-1 S.T. 54-2 R.C. 54-94	N. Y. State Thruway—Erie Section—Sub. 4 (Roberts Road—Route 20); 7 Misc. Sec. Cross Roads and Fredonia-Silver Creek Pt. 3A, S.H. 8038	6.54 Thy. (2.92 Acc.)	9" Two Crse. Cem. Conc. Pavt. 2 @ 25' Var. Wide = 6.84 Mi.; Asp. Conc. Opt. = 0.12 Mi.; Bit. Mac. Ty. 1 = 2.21 Mi.; Misc. Work = 0.29 Mi.; 5 Hy. Seps. Comp. I-Beams 247.2', 243', 248.1', 231.6', and 239.1'; 2 Brs. Twin Boxes 28' & 28'; 1 RR Sep. Plate Girder 278'.	$250,000 Plans $100	$4,637,000
Chautauqua and Erie	E.T. 54-2 S.T. 54-3 R.C. 54-95	N. Y. State Thruway—Erie Section—Sub. 5 (Route 20—Four Mile Level Rd.); 4 Misc. Sec. Cross Roads and Silver Creek-Forestville, S.H. 149; Marg. Rds. A, B and C	6.35 Thy (3.44 Acc.)	8" & 9" Two Crse Cem. Conc. Pavt. 2 @ 25' Var. Wide = 6.80 Mi.; Asp. Conc. Opt. = 1.48 Mi.; Found. Crse. Grav. = 1.30 Mi.; Misc. Work = 0.21 Mi.; 3 Hy. Seps. Comp. I-Beams 153.7', 216' and 229.6'; 1 Hy. Sep. Closed Box 29'; 2 Brs. Conc. Arch & Trestle 285.7' and 256.8'; 1 Br. Deck Truss 664'	$350,000 Plans $100	6,407,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit. Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: August 25, 1954

Construction of Sanitary Sewer

CONSTRUCTION OF TRUNK SEWER NO. 4
SOUTH AVENUE (STA. 48+49.2 TO STA. 51+69.7)
SOUTH AVENUE TO W. WINDING RD. & YATES BLVD.
CONTRACT NO. 2
CITY OF POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

Sealed bids for Contract No. 2, South Avenue (Sta. 48+49.2 to Sta. 51+69.7) South Avenue to W. Winding Rd. and Yates Blvd., for the construction of a Sanitary Sewer will be received by the Commissioner of Finance, City Hall, Poughkeepsie, New York until 10:00 A.M., Daylight Saving Time, Wednesday, August 25, 1954, and there at said office and at said time will be publicly opened and read aloud.

Contract No. 2 includes the construction of approximately 324 linear feet of 33-inch diameter sewers and approximately 3200 linear feet of 10-inch diameter sewers and appurtenances.

Plans and Documents may be examined at no expense at the office of the Commissioner of Finance, City Hall, Poughkeepsie, New York, and copies of the same obtained there upon payment of $10.00 for each set. Any bidder upon returning said set in good condition within thirty (30) days of the date of receiving bids will be refunded his payment, and any non-bidder upon so receiving said set will be refunded $5.00.

The Plans and Documents may be examined in the office of the Superintendent of Public Works, Eastman Park, Poughkeepsie, New York, or at the office of O'Brien & Gere, Consulting Engineers, 204 East Jefferson Street, Syracuse, New York.

Each bid must be accompanied by security in amount not less than five per centum (5%) of the amount of the bid in the form and subject to the conditions provided in the Information for Bidders contained in the Contract Documents.

The right is reserved to waive any informalities in the bids and to reject any or all bids.

DEPARTMENT OF FINANCE OF THE CITY OF POUGHKEEPSIE
By: AUBREY B. COONS
Commissioner of Finance

Read the Official

Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

Bids: August 24, 1954

Palisades Interstate Parkway, Sec. 2-L, Planting

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Palisades Interstate Parkway, Section 2-L, from Fort Lee Bridge Plaza to Palisades Avenue, Planting, Boroughs of Fort Lee and Englewood Cliffs, Bergen County. Length 2.046 miles. The principal items of work are:

Estimated:
- 209 Trees—Deciduous
- 207 Trees—Evergreen
- 700 Trees—Small & Flowering
- 7,750 Shrubs
- 355 Vines
- 960 cu. yds. Top soil

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, August 24, 1954, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: September 1, 1954

Construction of Pumping Stations

CITY OF ALEXANDRIA, VIRGINIA,
SANITATION AUTHORITY
PUMPING STATIONS

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M. Eastern Daylight Time, September 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of sewage pumping stations in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under Division E. The bidders may submit a proposal for the complete Division, but not for any part of the Division.

Division E, Pumping Stations, comprises the construction of the River Road Pumping Station and the Four Mile Run Pumping Station. The work includes the substructures, superstructures, the furnishing and installation of the pumping equipment, electrical work, outside piping, grading and roadways. The River Road Pumping Station has an installed pumping capacity of 1.2 million gallons a day and the Four Mile Run Pumping Station has an installed pumping capacity of 18.0 million gallons a day.

The Instructions to Bidders, Proposal, Form of Bid Bond, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) JAMES J. CORBALIS, JR.
Engineer-Director

Dated: July 21, 1954
Alexandria, Virginia

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4223) will be received at Albuquerque, New Mexico, until September 14, 1954, for furnishing labor and materials for closed drains, rehabilitation-drainage, Unit AE-2, Middle Rio Grande Project, New Mexico. Location approximately 4 miles south of Albuquerque, New Mexico. Principal items are excavation and backfill of pipe trenches, 15,000 cu. yds.; furnishing and placing gravel backfill about drain pipe, 3,000 cu. yds.; constructing drains with uncemented joints, 22,600 lin. ft.; and other work. Completion time 160 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4220) will be received at Albuquerque, New Mexico, until September 9, 1954, for furnishing labor and materials for: Isleta Diversion Dam Rehabilitation. Location: 13 miles south of Albuquerque, N. Mex. in Bernalillo and Valencia Counties. Principal items are: Excavation 15,200 cu. yds., grouting 12,000 cu. ft., concrete 1,100 cu. yds., steel sheet piling 440,000 lbs.; and other work. Completion time 540 days. For particulars, address Bureau of Reclamation, Albuquerque, N. Mex., or Building 53, Denver Federal Center, Denver, Colo. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: August 31, 1954

Adjustable Ferry Ramps

Sealed bids for the construction of adjustable car and passenger handling ramps, with counter weights and electrical equipment, for the Marine Ferry Terminal at Bar Harbor, Maine, will be received by the Canadian National Railways at the office of Fay, Spofford & Thorndike, 11 Beacon Street, Boston, Mass., on or before 2 P. M. daylight saving time on August 31, 1954. The bid must be accompanied by deposit of a certified check for $10,000.
Completion date April 30, 1955.
Copies of the Bid, Contract, Bonds, Specifications, and Drawings may be obtained at the office of Fay, Spofford & Thorndike, 11 Beacon Street, Boston 8, Mass. upon deposit of $25.

Canadian National Railways
R. O. Stewart
Chief Engineer
Montreal, Canada

Bids: September 1, 1954

Construction of Sewage Treatment Plant

CITY OF ALEXANDRIA, VIRGINIA,
SANITATION AUTHORITY
SEWAGE TREATMENT PLANT

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M. Eastern Daylight Time, September 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of a sewage treatment plant in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under the following Divisions. The bidders may submit a proposal for any Division, all Divisions, or any combination of Divisions, but not for any part of any Division.

Division I—General, comprises the construction of the treatment plant buildings, tanks and structures, including pile foundations, the furnishing and installation of piping and equipment, except for pumping and filtration equipment which are to be furnished under other Divisions, but are to be installed under this Division, outside piping, grading and roadways.

Division II—Pumping Equipment, comprises the furnishing, testing and delivering of two 21 M.G.D., one 10 M.G.D., and one 5 M.G.D. electric motor driven pumps and two 21 M.G.D., and one 14 M.G.D. gas engine driven pumps operating at heads varying from 15 to 40 feet. Included in this Division are the required motors, engines, and drives and supervision of the installation of the equipment.

OFFICIAL PROPOSALS

Division III—Vacuum Filtration Equipment, comprises the furnishing, testing and delivering of two vacuum filters, each 10 feet in diameter and 10 feet long, all accessory equipment, and supervision of the installation of the equipment.

Division IV—Electrical work, comprises the furnishing and installation of all electrical controls, switchgear, wiring, conduits and lighting fixtures.

Division V—Heating and Ventilating Work, comprises the furnishing and installation of boilers, convectors, unit heaters, air conditioning equipment, piping and appurtenances.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) JAMES J. CORBALIS, JR.
Engineer-Director

Dated: July 21, 1954
Alexandria, Virginia

Bids: August 24, 1954

Palisades Interstate Parkway, Sec. 1-H

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Palisades Interstate Parkway, Section 1-H, from Sta. 407 + 00 to Sta. 516 + 66; Grading, Paving and Bridges, Borough of Alpine, Bergen County. Length 2.053 miles. Principal items of work are: Estimated:

	Roadway Items
28,608	cu. yds. Roadway Excavation—Earth
51,194	cu. yds. Roadway Excavation—Rock
67,500	cu. yds. Borrow Excavation
26,250	cu. yds. Subbase
49,200	sq. yds. Stabilized Turf Shoulders, 6" thick
75,400	sq. yds. Macadam Base Course, 8" thick
74,000	sq. yds. Pavement, Type MA-BC-2, 3" thick
9,772	lin. ft. Reinforced Concrete Culvert Pipe
5,366	lin. ft. Corrugated Metal Pipe
89	Inlets
31,913	lin. ft. White Concrete Curbs, Vertical & Sloping
5,500	lin. ft. Rough Cut Timber Guard Rail
	Bridge Items
557	cu. yds. Class B Concrete in Structures
50,160	lbs. Reinforcement Steel in Structures
117,600	lbs. Structural Steel
6,600	sq. ft. Stone Masonry

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, August 24, 1954, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder

OFFICIAL PROPOSALS

in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: August 31, 1954

Goethals Bridge Modifications to New Jersey Approach
The Port of New York Authority

CONTRACT GB-120.001

Sealed proposals for modifications to the New Jersey Approach of the Goethals Bridge in Elizabeth, New Jersey will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 31, 1954, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY

Howard S. Cullman, Chairman

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4204) will be received at Phoenix, Arizona, until September 8, 1954, for furnishing labor and materials for additions to Maricopa Substation, Davis Dam Project, Arizona-Nevada. Location near Maricopa, Arizona in Pinal County. Principal items are 1,860 cu. yds. excavation; 150 cu. yds. concrete; lump sum, constructing service building addition; 100,000 pounds, erecting steel structures; 27 transformers, installing transformers; and other work. Completion time 260 days. For particulars, address Bureau of Reclamation, P. O. Box 392, Phoenix, Arizona; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: September 1, 1954

Indiana Toll Road Commission

309 Wast Washington Street
Old Trails Building
Indianapolis, Indiana

NOTICE TO BIDDERS
CONTRACT C-24 CONTRACT C-25
CONTRACT C-24 and C-25

Sealed proposals will be received by the Indiana Toll Road Commission at or before 10:00 A.M., Central Standard Time, September 1st, 1954 for the performance of each of the contracts enumerated above.

CONTRACT NO. C-24

The grading, drainage, structures and paving of approximately three and five-tenths (3.5) miles on Construction Section C-24 of the Indiana East-West Toll beginning at Station 3460 plus 80 on the Toll Road Centerline, said point being in Section Sixteen (16), Township Thirty-Eight (38) North, Range One (1) West, LaPorte County, approximately nine hundred twenty-four (924') feet West of the County line between LaPorte and St. Joseph Counties, and extending Easterly to Station 3645 plus 55 on the Toll Road Centerline, said point being approximately one thousand ninety-nine (1099') feet East from the West line of Section Seven (7), Township Thirty-Eight (38) North, Range One (1) East, St. Joseph County, Indiana. The approximate quantities of the major items of construction are as follows:

Common excavation 299,000 cubic yards
Borrow 73,800 cubic yards
10" Reinforced concrete pavement 97,900 square yards
Culvert pipes and underdrains 6,934 lineal feet
14" dia. x 7 ga. cast in place piling 5,200 lineal feet
Concrete for structures 1,634 cubic yards
Reinforcing steel 238,200 pounds
Fabricated structural steel 493,600 pounds

CONTRACT NO. C-25

The grading, drainage, structures and paving of approximately three and nine-tenths (3.9) miles on construction section C-25 of the Indiana East-West Toll Road beginning at Station 3645 plus 55 on the Toll Road Centerline, said point being approximately one thousand ninety-nine (1099') feet east from the west line of Section Seven (7), Township Thirty-Eight (38) North, Range One (1) East, St. Joseph County, and extending easterly to Station 3851 plus 10 on Toll Road Centerline, said point being approximately five thousand one hundred twenty-two (5122') feet east of Sycamore Road, St. Joseph County, Indiana. The approximate quantities of the major items of construction are as follows:

Common excavation 588,500 cubic yards
Borrow 91,200 cubic yards
10" Reinforced concrete pavement 108,500 square yards
Culvert pipes and underdrains 4,954 lineal feet
14" Dia. x 7 Ga. cast in place piling 7,700 lineal feet
Concrete for structures 2,768 cubic yards
Reinforcing Steel 386,150 pounds
Fabricated Structural Steel 675,900 pounds

Notice to Bidders
The work covered by Contract C-24 and C-25, which covers a combination of construction Sections C-24 and C-25, is the construction as above described for the individual construction sections. Taken together.

Copies of the plans, specifications and proposal forms for said contracts are available for public inspection or purchase at the Office of the Chief Engineer, Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis Indiana. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable.

Standard Specifications for the Indiana East-West Toll Road—$5.00
Plans, Special Provisions and Proposal Forms, per set per construction section: $25.00
Informational Drawings
Cross-sections, per set, per construction section: $25.00
Soil Plan and Profiles, per set, per construction section: $5.00

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Contractor's statement for qualification on the forms supplied by the commission will be required from all bidders

Each proposal must be accompanied by a proposal guaranty in the amount of Five (5%) percent of the total price bid per construction section covered by the contract. If the bidder shall tender bids for two or more contracts which include the same construction section, the construction section thus duplicated in the bidding need be counted only once in determining the total amount of the Proposal guaranty. The Proposal guaranty shall be in the form of an acceptable surety bond or certified check on a solvent bank.

If the bidder is an out of state corporation, he shall be required to furnish a certificate from the Secretary of State of Indiana as evidence that the corporation has complied with the Indiana Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Indiana.

All bids must be received at or before 10:00 A.M. Central Standard Time, September 1st, 1954, in the offices of The Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. At said hour, the bid box will be publicly opened and read. The award of any of the above-enumerated contracts, if any award be made, will be to the bidder or bidders whose proposal or combination of proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The commission reserves the right to reject any or all proposals and to waive technicalities.

Indiana Toll Road Commision

Dr. Dillon Geiger, Chairman
Charles W. Keating, Secretary-Treasurer

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

Bids: September 1, 1954

Construction of Intercepting & Trunk Sewers

CITY OF ALEXANDRIA, VIRGINIA
SANITATION AUTHORITY
INTERCEPTING AND TRUNK SEWERS

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M., Eastern Daylight Time, SEP. 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of intercepting and trunk sewers in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under the following Divisions. The bidders may submit a proposal for any Division, all Divisions, or any combination of Divisions, but not for any part of any Division.

Division A—Potomac Interceptor, comprises the construction of approximately 8,490 linear feet of 42 inch, 1,650 of 36 inch and 2,370 feet of 18 inch concrete pipe sewer together with all connecting sewers, special crossings, manholes, house connections, and other structures as shown, specified and directed.

Division B—Commonwealth Interceptor, comprises the construction of approximately 1,250 feet of 72 inch, 550 linear feet of 42 inch, 5,050 linear feet of 36 inch, 1,530 linear feet of 33 inch, 3,980 linear feet of 30 inch, 1,950 linear feet of 18 inch, 1,304 feet of 15 inch concrete pipe sewer, 4,620 linear feet of 24 inch reinforced concrete force main and 335 linear feet of 8 inch cast iron force main, together with all connecting sewers, inverted siphons, special crossings, manholes, and other structures as shown, specified and directed.

Division C—Holmes Run Trunk Sewer, Section I, comprises the construction of approximately 8,660 linear feet of 60 inch, and 6,990 linear feet of 54 inch concrete pipe sewer, together with all connecting sewers, inverted siphons, special crossings, manholes, diversion structures, metering stations, and other structures as shown, specified and directed.

Division D—Holmes Run Trunk Sewer, Section II, comprises the construction of approximately 6,200 linear feet of 36 inch 1,770 linear feet of 33 inch and 4,090 linear feet of 30 inch concrete pipe sewer, together with all connecting sewers, inverted siphons, special crossings, manholes, diversion structures, metering stations, and other structures as shown, specified and directed.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) James J. Corbalis, Jr.
Engineer-Director

Dated: JUL. 21, 1954
Alexandria, Virginia

Bids: September 9, 1954

Viaduct Superstructure, Philadelphia, Pennsylvania

DELAWARE RIVER PORT AUTHORITY
Administration Building
Camden, New Jersey
CONTRACT NO. P-3

Sealed bids will be received for Viaduct Superstructure, Philadelphia Anchorage to Second Street, for new Bridge between Packer Avenue, Philadelphia, Pennsylvania, and Gloucester, New Jersey, known as Contract No. P-3, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:00 P.M., (Daylight Saving Time), September 9, 1954, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $400,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

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The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office W. 42nd St., N. Y. 36 for Aug. 26th issue closing August 16th.

ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company

505 Park Avenue, New York 22, N. Y.

STRUCTURAL ENGINEER

Ten to fifteen years experience in design of airfield structures in association with architects. Must have ability to supervise one or more design groups, write specifications, reports and design analyses, and to develop design from preliminary architectural drawings and follow job through until final drawings and specifications are complete. Location Boston.

CIVIL ENGINEER

Ten to fifteen years experience in airfield planning, grading and paving design, site planning pertaining to airfields and associated structures including utilities, design of water supply and sewage disposal systems. Must have ability to supervise one or more design groups, write specifications and reports, design analyses and quantity estimates.

ASST. ENGINEERS

Six to ten years with experience along lines of that listed above. Location Boston. Write

P-3557, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Experienced Construction Equipment Salesman to sell Heavy Construction Equipment on Long Island

Salary—Commission—Expenses—Company Car

Call for Appointment

The Jaeger-Lembo Machine Corp.

127-04 Northern Blvd., Corona, N. Y.

Newtown 9-7777

HIGHWAY and BRIDGE DESIGNERS

Experience required in highway or structural design. Excellent opportunity for Engineers qualified to design modern expressways and bridges. Location in Harrisburg, Penna. with excellent living conditions. Include experience and salary requirements in first letter.

GANNETT FLEMING CORDDRY & CARPENTER, Inc.

P. O. Box 366 Harrisburg, Pennsylvania

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: Instructor of Engineering Drawing and descriptive geometry. Salary up to $4,700 for 9 month period and assistant professorship for qualified person. M. E. graduate preferred. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

CITY ENGINEER — City of Montebello, California (pop. 25,000) invites applications. California registration with one year of experience in municipal government in administrative capacity. Salary range—$629-703. Maximum age 65. Apply by September 1, 1954 to Personnel Officer, City Hall, 140 North Sixth Street, Montebello, California.

WANTED: CONSTRUCTION Engineer to aid in construction of shopping centers. Age preference, 30 to 45 years. Must be able to estimate, purchase, expedite and coordinate construction work. Good opportunity for person to work into permanent position with an established and growing construction company. P-3323, Engineering News-Record.

FIELD SUPERINTENDENT, experienced, for large scale seeding work in several eastern states. Permanent. Steve Brody Inc., Lynbrook, N. Y.

JUNIOR, ASSISTANT and senior engineers for City of Rochester, N. Y. Salaries $3972 to $6930. Write Civil Service Commission, 242 Main St. W., Rochester 14. Closing date for applications August 26th.

GENERAL CONTRACTOR now in process of expanding field supervisory force on aluminum reduction plant located in Northwest section of country. Considering applications for general superintendent, area and assistant area superintendents, mechanical superintendents and office engineer. Submit complete details including age, education, experience, references, availability, and salary expected. P-3484, Engineering News-Record.

ENGINEERS, COMPETENT and experienced in design and supervision of construction and as resident engineers on water works, sewer systems, sewage and water treatment. State experience, when available, salary requirements, references. P-3452, Enginering News-Record.

WANTED—AN engineer qualified to make surveys and design water and sewer systems or treatment plants. Location—Southeast Pennsylvania. State experience and salary desired in first reply. P-3458, Engineering News-Record.

WANTED

Foreman, first class only, for general heavy construction work; experienced in concrete form work, earthwork, etc., with plan reading and layout ability.

Foreman, roadwork, first class only, experienced on macadam and bituminous paving.

Engineer, civil, first class only, for heavy construction work, experienced in office or field work.

Draftsman, mechanical, experienced detailing industrial process pipe work.

Write P. O. Box 126, Wilmington, Delaware.

POSITIONS VACANT

CLERK OF the Works. Heavy experience in large building projects to serve as Resident Engineer on construction of High School starting September. Send resume of education, experience and salary expected to Herman J. Connors, Business Manager, Board of Education, Passaic, New Jersey.

WANTED EXPERIENCED structural steel detail draftsman for small shop doing general fabricating business in Class A structural steel for buildings. Man must be fast, thorough and accurate. Give age, experience, references and salary expected with application. Berger Steel Company, Inc., Lafayette, Ind.

OPENING—SUPERINTENDENT of Municipal Power Plant (Steam Turbines) in City of 2700 population. Thirteen employees. Apply in writing to Joseph N. Fischer, Mayor, Carlyle, Illinois, stating age, education qualifications, experience, salary expected and references.

PART TIME Estimator—Superintendent, P. E. or graduate, 20 years full charge experience commercial, industrial, public works for Long Island general contractor. P-3587, Engineering News-Record.

SUPERINTENDENT FOR Transit-Mix Plant—to run plant in central part of New Jersey. State experience and salary required. Reply P-3589, Engineering News-Record.

LARGE EASTERN contracting company engaged in heavy construction desires man to fill position as superintendent of equipment maintenance. Position permanent for right man. Include education, experience, references, and salary expected in application letter. Reply P-3556, Engineering News-Record.

COLORADO COLLEGE has a vacancy for an instructor or assistant professor in Civil Engineering, salary approximately $4000 for nine months; rank and salary to vary according to qualifications and experience. Write Dean Sterg O'Dell, Colorado College, Colorado Springs, Colo.

ESTIMATOR AND Management assistant for medium sized iron work fabricating shop in Detroit-Michigan.—structural steel, stair and fire escape work and miscellaneous iron work for building construction. Experience essential, bid pricing also technical knowledge in design and fabrication. State qualifications and salary desired. P-3538, Engineering News-Record.

CIVIL, HIGHWAY, Drainage and Bridge Engineers, Designers, Specification Writers, Cost Estimators, Draftsman, and Surveyors for Permanent assignment on Airport, Highway, Expressway and Bridge Projects. Location East and Southeast States. An opportunity for producers of quality work. Submit resume, age, education, experience, title and duties, references, salary required, and availability. P-3593, Engineering News-Record.

(Continued on the opposite page)

Additional Position Vacant Advertising on opposite page

POSITIONS VACANT

(Continued from the opposite page)

CHIEF ESTIMATOR. General Contractor operating in South and Midwest desires experienced building estimator. Excellent opportunity for man able to accept full responsibility with aggressive, growing concern. Reply fully, stating, experience, personal data and salary requirements to Blount Brothers Construction Company, P O Box 1144, Montgomery, Alabama.

ESTIMATING OPPORTUNITY—Recent graduate with some field experience on commercial and industrial building for quantity surveys. Opportunity for man interested in estimating with well established firm, headquarters Central Illinois. State qualifications & salary expected. P-3549, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

EMPLOYMENT SERVICE

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

EMPLOYMENT AGENCIES

WANTED ENGINEERS, Designers, Draftsmen-Structural, Architectural, M.E., C.E., E.E., and Industrial, also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

CONSTRUCTION OR Sales Engr. 29 B.S.C.E. 5 yrs. experience on Municipal work, Sewerage treatment, water treatment, earth fill dams, highways and pipeline work, 2 years of administrative work. 1 year of sales management work. Only responsible positions considered. PW-3337, Engineering News-Record.

PROJECT MANAGER - SUPERINTENDENT: C.E. 20 yrs. experience heavy industrial, pipeline, gas compressor stations, highways and hydro-electric projects. Aggressive growth individual and a go-getter. Believe in finishing projects on time. Presently employed. Available Sept. 1st. Interested primarily in foreign assignment. Excellent references. Working knowledge Spanish and Turkish. PW-3294, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT Mechanical and Structural Engineer, can take full charge of project including all related trades on heavy or light construction. Want responsible position with general contractor or architectural firm. Prefer south or southwest. Very good references. PW-3306, Engineering News-Record.

ARCHITECT'S SUPERINTENDENT — Available soon. Long experience. Box No. PW-3324, Engineering News-Record.

CONSTRUCTION SUPT. over 20 years broad experience — Industrial, institutional groups, commercial and schools. Engineer. PW-3372, Engineering News-Record.

TUNNEL CONSTRUCTION Supt. 20 years experience at tunnel excavation and concrete lining. Will consider foreign contract. References and back ground on request. Available after August 15, 1954. PW-3449, Engineering News-Record.

CONSTRUCTION ENGINEER, 55, registered. Over 30 years experience in field engineering and supervising construction of waterworks, sanitation, industrial plant, railroad, highway, municipal and heavy construction projects. Available after August 15. Prefer Mid Atlantic or Mid West location. PW-3486, Engineering News-Record.

CONSTRUCTION ENGINEER experienced in erection industrial, chemical, oil and gas plants desires job. Not too particular about location. PW-3508, Engineering News-Record.

ESTIMATOR CIVIL engineering graduate, age 34, 10 years field and office experience in commercial, public, and industrial construction. Capable of complete handling of construction estimates, client negotiations, cost systems, purchasing and expediting, field supervision and job management. Desires permanent position with aggressive firm in central Penna., Md., Eastern W. Va., or will consider Northwest U. S. Good references. Available August 15th. PW-3487, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION ENGINEER, 18 yrs. experience, all types heavy construction. Capable, competent, cost conscious, reliable expeditor and co-ordinator. Desires position with architectural engineering firm in South or West. PW-3450, Engineering News-Record.

HEAVY CONSTRUCTION manager available. Can staff a job with most key personnel including engineering, accounting, foremen and superintendents. Reply Box PW-3453, Engineering News-Record.

ARCHITECTURAL DRAFTSMAN, Struct. Engr., Prefer Industrial & Commercial Bldgs., Central States. PW-3578, Engineering News-Record.

CIVIL ENGINEER, age 25, degree, 4 years experience highway and bridge (office), survey supervision (field), and construction materials (lab), to work for contractor. PW-3242, Engineering News-Record.

GRADE FOREMAN and engineer with wide experience in super-highway, municipal, railroad and airport construction. Conscientious, aggressive and in good health. Desire salaried position with grading or general contractor. Will travel. PW-3586, Engineering News-Record.

CONSTRUCTION ESTIMATOR, office Engineer 20 years experience on fine residential, commercial, heavy industrial, and institutional construction, familiar with pricing, sub-contracts, requisitioning, expediting, purchasing, and field supervision, capable supervisor of personnel. Age 42, training in Architectural Engineering, married, desires permanent connection with salary and bonus arrangement. PW-3571, Engineering News-Record.

EXPERIENCED CONSTRUCTION Superintendent wants job. Location immaterial. PW-3532, Engineering News-Record.

VICE PRESIDENT and Manager of medium sized General Construction Firm wishes to relocate in Middle Southern States. Successful record in business and community. Will invest capital at your option. PW-3531, Engineering News-Record.

BRIDGE SUPERINTENDENT or Carpenter foreman, 28 years experience, sober, cost conscious, good organizer, hard pusher, Eastern states preferred. Available now. PW-3517, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, ten years experience Industrial Construction. Project manager on Distillery Construction and Uranium Project. Recent experience Prestressed Concrete. Capable complete supervision on Industrial project or managing Prestressed Concrete Branch for General Contractor. Will locate anywhere United States or Canada. Box 29, Cromwell, Connecticut.

CHIEF-ACCOUNTANT—Office Manager seven years experience Latin America desires position in Latin America or Far East. Available after one month. No family. PW-3516, Engineering News-Record.

GRADUATE CIVIL Engineer, journeyman carpenter & Bridge sup't. Experienced contractor's engineer, office & field, specializing in concrete form design & field supervision of bridges. Commercial & industrial bldg's & housing. Family man desires permanent location with general contractor in South or Southeast. PW-3515, Engineering News-Record.

(Continued on the following page)

LEARN ESTIMATING

Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:

TAMBLYN SYSTEM
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Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
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GEO. E. DEATHERAGE & SON CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Every step explained.
WILSON *Engineering Corp*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

BRIDGE ENGINEERS AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

ESTIMATOR WANTED
Commercial and Industrial Construction

Graduate Engineer not over 40 years old. Must be thoroughly experienced in cost analysis and project planning. Unusual opportunity for an unusual young man to associate himself with 35-year old successful Engineering and Construction organization with principal offices in Pittsburgh, Pennsylvania. Compensation commensurate with ability. Splendid opportunity for advancement to top executive position. We are interested only in those meeting the above requiremnts.

P-3575, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

OPPORTUNITY
For an energetic engineer with sales personality

25 to 35 years of age, for sales work with company operating on nationwide basis furnishing Concrete Form Engineering and Rental Service. General construction experience and some Engineering college training essential. Give full details in first letter to

R. P. Wilkinson, Economy Forms Corp.
4301 N. E. 14th St., Des Moines 13, Iowa

MECHANICAL ENGINEER WANTED

Graduate Mechanical Engineer experienced in the operation of Fourdrinier paper machines, refining and related equipment for large progressive mill in Middle Atlantic States. Under 35 years of age. Good salary and excellent opportunity for advancement. Give detailed resume of experience.

P-3545, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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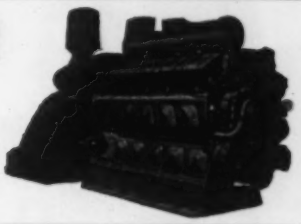

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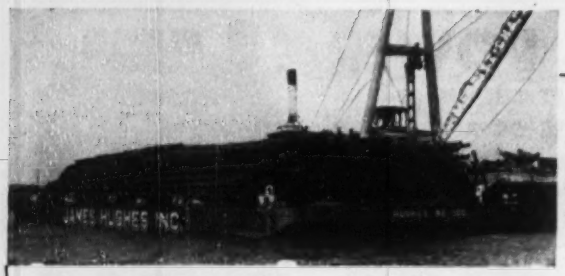

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Another

sewage disposal plant calls on WROUGHT IRON PIPE

for protection against corrosion

This new $5,500,000.00 City of Cincinnati Sewage Disposal Plant adds another to the growing list of plants—large and small—where wrought iron pipe is helping to maintain operational routine, reduce maintenance and costly repairs and replacement.

Havens & Emerson, Cleveland, Ohio, were engineers on the project; L. E. Stevens, Newport, Ky., was the plumbing and heating contractor.

Our bulletin, *Wrought Iron for Sewage Treatment and Disposal Installations,* gives the complete story of wrought iron protection, and illustrates a variety of services where it is serving longer, at lower cost per year. Write for your copy.

The pipe that lasts the longest, costs the least . . .

The only *valid comparison* of piping costs is INSTALLED COSTS *plus* REPAIRS. This yardstick places the emphasis where it rightly belongs . . . on SERVICE LIFE. In installation after installation, wrought iron pipe has doubled, tripled and even quadrupled the useful service life previously obtained from low-first-cost piping. All this adds up to one thing . . . wrought iron gives you *piping economy,* because it lasts longer, at lower cost per year!

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ELECTRIC FURNACE QUALITY STEEL PRODUCTS

LONG SCREED six ready-mix trucks busy. Bare spot at right is drain location.

Long screed shortens working time

Through the use of a 33-ft screed, Frank W. O'Connell, contractor on a warehouse job in Binghamton, N. Y., was able to pare the cost of installing a concrete floor.

On this floor, it would have been extremely difficult to strike off a 33-ft section by hand using a 2x4 beam. However, the long screed, because of the roller assemblies and the vibration of the beam, was pulled along by just three men—two on the ends and one in the center hauling on a rope.

Also, because of the screed's vibration, it was possible to use a 1-in. slump concrete that permitted rotary troweling an hour after screeding. This compares with 3 or 4 hrs when wet mixes required by hand methods are used.

Time was saved too since fewer forms were used and less form leveling was necessary. The lower half of the slab was placed and reinforcing was installed, followed by the rest of the concrete to achieve form level. In areas where insufficient concrete had been placed all that was necessary was to tip the screed back on its rear rollers and roll it back for a second pass.

The end roller assemblies are mounted in such a manner that they can be slid along the beam for adjustment of span length. The beam is bolted together at the center so that it can be disassembled for easier transport—cables prevent sag. Vibratory power is supplied by a 4-cycle gasoline engine mounted amidships. STOW MFG. CO., 443 STATE ST., BINGHAMTON, N. Y.

TD-24 gets torque converter drives for smooth pushing

Designed primarily as a push-loading tractor, the new TD-24 torque converter tractor is said to provide the needed pushing power at required speed without shifting gears—speed and power are increased by merely advancing the throttle. The result is smoother, faster push contacts with haul units.

The new torque converter model has the same dimensions as the standard TD-24 and all attachments are interchangeable. Power plant on both machines is the same, but the new model operates at 1,500 rpm—1,000 rpm faster than the standard tractor.

The new two-speed transmission is full reversing, and provides four speeds forward and four reverse. Top forward speed is 6.9 mph; top reverse is 6.6 mph.

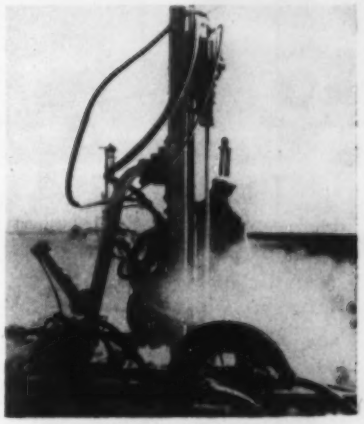
Weight of the fully equipped TD-24 torque converter tractor with 7-roller track frame is 43,250 lb. INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Dual hydraulic lifts aid in spotting new wagon drill

The Gardener-Denver Model URM is a new wagon drill that is said to eliminate much of the time and effort required for spotting holes. The drill wagon is equipped with two hydraulic lifts that raise or lower the U-bar while the drilling mast is being maneuvered into position.

The drill wagon carries the chain feed and a 4-in. drill that is said to combine fast and powerful hammer action with the ability to keep the steel rotating in bad ground. Steady rotation with hole cleaning at full line pressure and a powerful pull for extracting steel means that the unit could save deep holes that otherwise might be lost in broken ground.

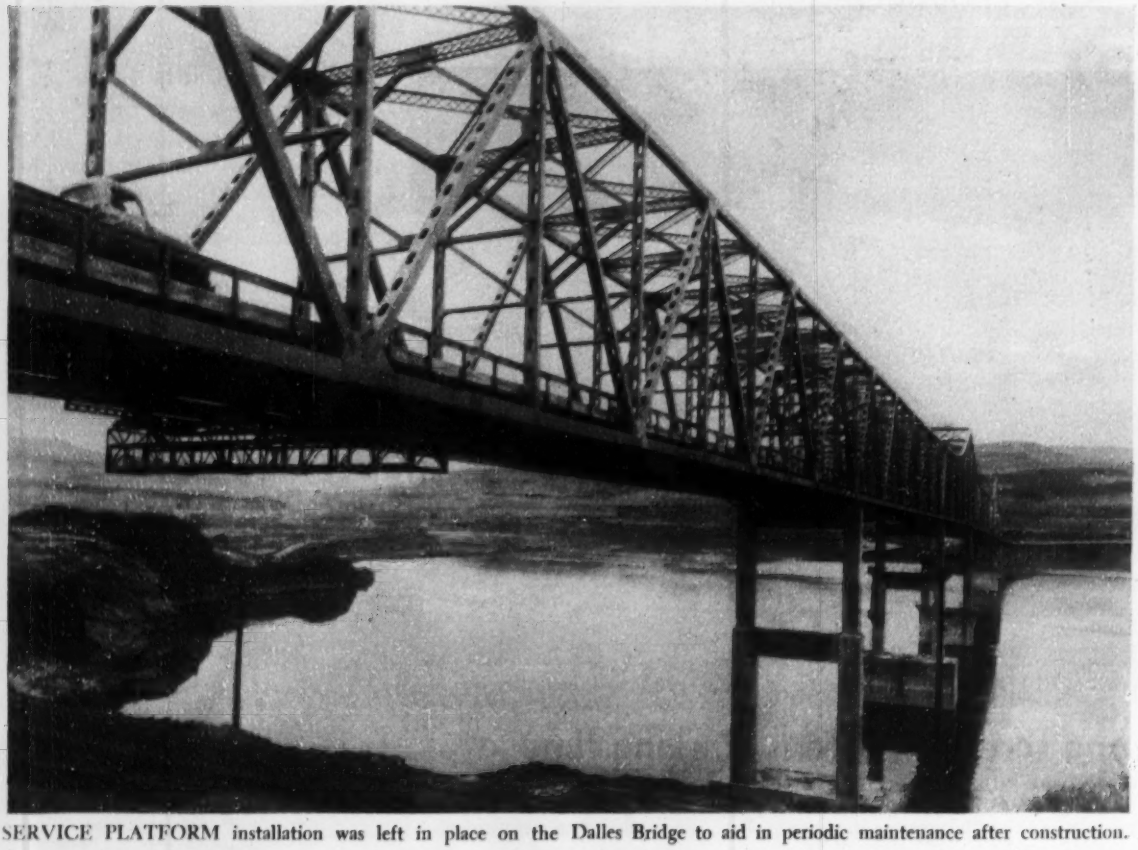
A single drill control handle operates all drilling, blowing and hole-cleaning actions. THE GARDENER-DENVER CO., QUINCY, ILL.



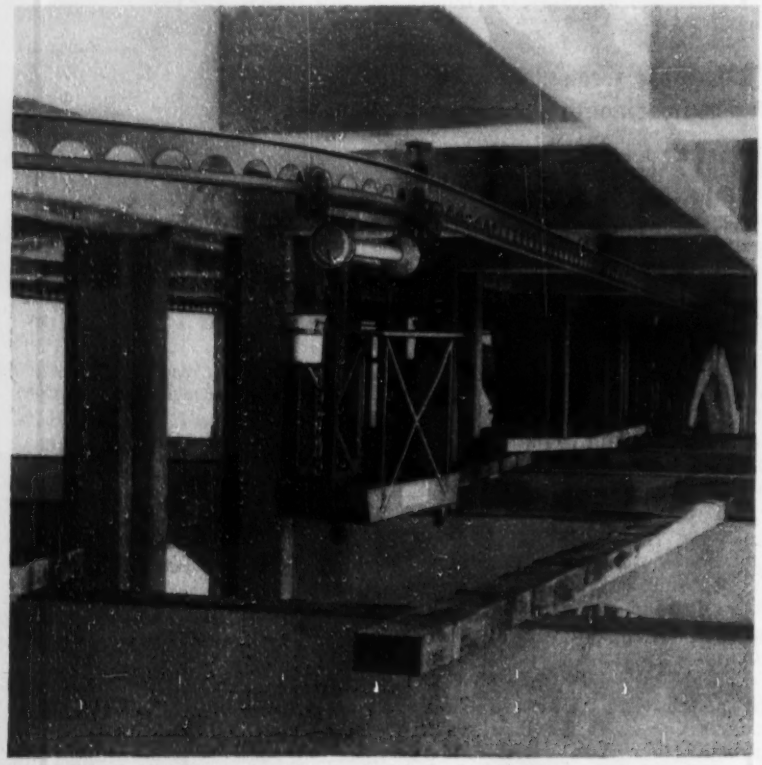
Lift Specifications

Ht. of Boom or U-Bar in Vert., Pos.	5'10"
Width overall	5'7"
Length overall (Drill Wagon)	7'2"
Length overall (Feed Mounting)	11'8"
Tread of wheels	4'10½"
Swing of wheels	180°
Front Wheel Pneumatic Tire size	6.00x16
Tail Wheel Pneumatic Tire size	4.00 x 8
Maximum Feed Travel	9'4"
Steel Change	8'
Drill Steel recommended	1¼" round
Main air hose recommended	1¼"
Weight of Drill Wagon only	900 lbs.
Weight of Feed Mounting only	641 lbs.
Weight of Drill only	141 lbs.
Weight of complete outfit	1682 lbs.
Tilting range of U-bar is from 15 degrees below horizontal to practically vertical	

(*New Products continued on page 120*)



SERVICE PLATFORM installation was left in place on the Dalles Bridge to aid in periodic maintenance after construction.



CONCRETE ARCH bridge in Pittsburgh uses single rail system; cars can be lowered.

Tramrail system

Eases construction and maintenance of bridges

Savings in construction and further savings in maintenance costs throughout the life of the bridge are promised with the purchase of a Cleveland Tramrail Bridge Servicing System.

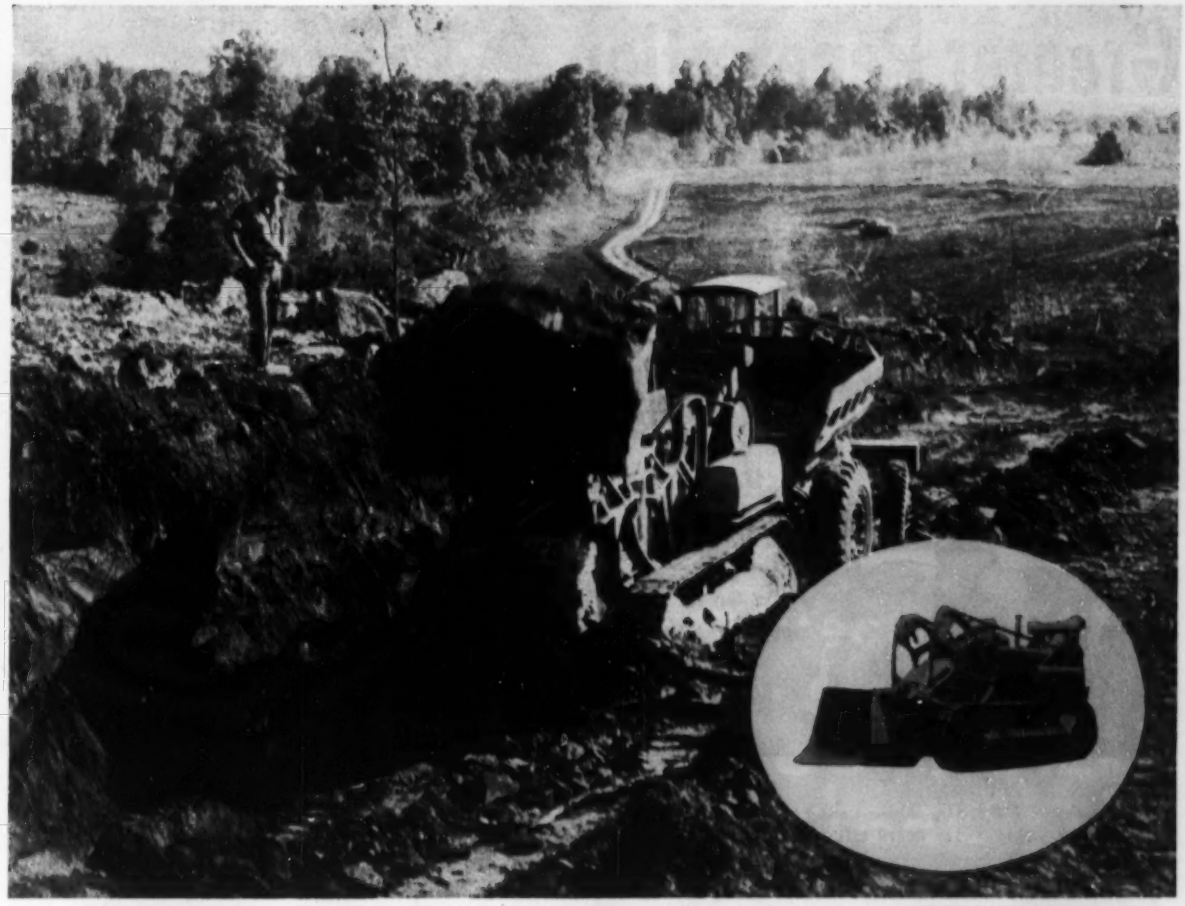
The Tramrail installation on the Dalles Bridge over the Columbia River (above) is offered as an example. The system here included six traveling service platforms operating between piers; each of the platforms are 37½ ft long to extend beyond the bridge sides.

According to the manufacturer, the equipment reduced the man-hours required to set bridge deck forms, speeded assembly of many structural members, simplified placing of electrical conduits, aided in inspection and saved painting time.

However, now that the bridge is completed, the Tramrail also serves as a servicing point for the underside—reducing long range costs.

The twin rail system is powered by a hand crank located at the middle of the platform. A shaft extending the

(*Continued on page 122*)



TWICE THE PRODUCTION — FOR THE SAME $ INVESTMENT

The clay digging job shown in the picture and reported in the adjacent column is being excavated as shown in the sketch above. Successive cuts are taken at an average depth of 6-8 feet with 105's which provides fastest digging with no danger from undercutting.

Digging in clay without the benefit of preliminary ripping or drilling and shooting was the basis of the test between this Eimco 105 and an ordinary front end shovel loader of equal size and price.

Four trucks of the same size, design and manufacture were used. Two were assigned to each loader.

Results — the Eimco 105 could dig the hard clay easily and load quickly with an inexperienced operator at the controls. One day's production — 153 trucks with the Eimco waiting on trucks much of the time.

The ordinary shovel loader had difficulty digging, was slow to maneuver and loaded 75 trucks in the same time with trucks waiting to be loaded all the time.

This customer bought its second Eimco 105 a week after the first was on the job.

Eimcos deliver on all types of jobs and you can have — "Twice the production for the same $ investment" — when you use Eimco 105 tractors with loading attachments.

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Note also, Hayward's extreme simplicity, the smaller number of parts—and all easily accessible—the larger closing sheaves particularly shaped to minimize rope wear, the extra large load capacity.

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length of the platform drives wheels on both sides.

On concrete arch structures such as the Penn-Lincoln Parkway Commercial Street Bridge in Pittsburgh, a continuous track Tramrail can be used. It employs a small unit that is propelled by means of a hand chain. Two units are employed between the sets of triple arches to provide access to the entire length of the bridge. The inspection cars also can be lowered between any pair of arches.

Details on the system are described in Booklet No. 2008. CLEVELAND TRAMRAIL DIV., THE CLEVELAND CRANE & ENGINEERING CO., WICKLIFFE, OHIO.

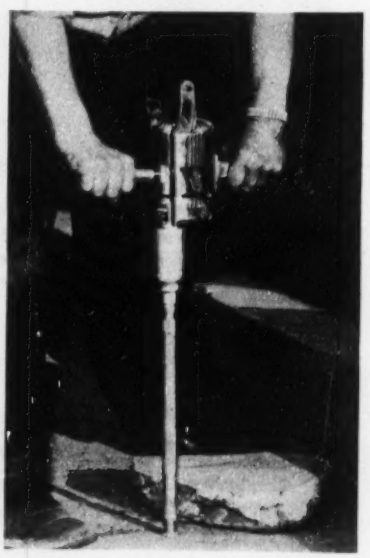
Rotary hammer bores 3/16 to 1½-in. holes 40 ft deep

Simultaneous hammering and rotating action is the big feature of the Demo Model DL-375S hammer. The tool rotates at 1,000 rpm and strikes 6,000 blows per min.

The hammer weighs only 9½ lb, yet, according to the manufacturer, the tool will drill self-cleaning holes ⅜ to 1½ in. in diameter through all materials including reinforced concrete without changing bits or drills. Coupled core tubes enable the drill to penetrate to a depth of approximately 40 ft.

The tool is powered by a fully guaranteed 115-v, 5-amp AC-DC, 60-cyc or less Thor electric motor. No lubrication is required and the hammer has no springs requiring maintenance. DEMO TOOL CORP., 8735 MELROSE AVE., LOS ANGELES 46, CALIF.

(*New Products continued on page 124*)



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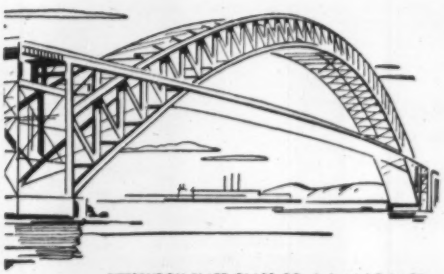

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1 Protects against corrosion during shipment and erection

2 Provides an excellent foundation coat for field painting

PITTSBURGH PAINT technicians have developed X-L-O Structural-Steel Primer to provide unusual protection for all kinds of fabricated structural shapes.

This product is derived from *extracted* linseed oil in combination with red lead and iron oxide pigments to give dependable protection against corrosion during transit and erection. It is also an excellent foundation for final coats.

X-L-O Primer is available in a combination of red lead and iron oxide pigmentations or can be furnished with 100% red lead, if desired. IRONHIDE top coats are also available in colors suitable for field coat application.

For further information, contact Pittsburgh Plate Glass Company, Industrial Sales Division, One Gateway Center, Pittsburgh, Pa., or the factory nearest you.

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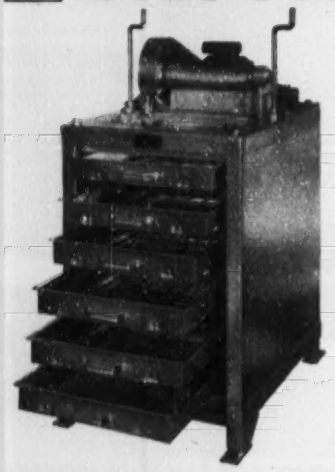

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The GILSON Mechanical Testing Screen cuts out error and guesswork in complying with sizing requirements for crushed stone, gravel, slag, coal, ores and similar materials . . . guarantees that every carload, every truckload is as ordered.

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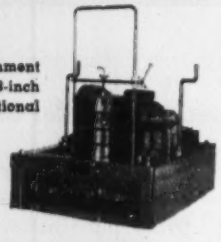

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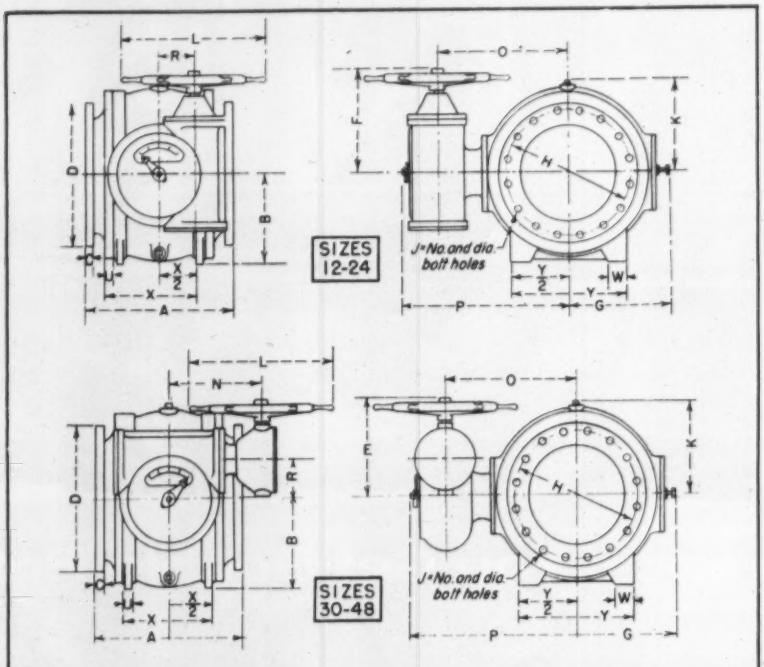


Valve size	A	B	C	D	E	F	G	H	J	K	L	N	O	P	R	U	W	X	Y	Approx weight	Valve size
12	19½	11½	1¼	19		14⅛	14⅛	17	12-1	11¼	17		18½	23⅜	4¾	1¼	2½	11	14½	1170	12
16	25	14⅜	1⅞	23½		17⅛	16⅞	21¼	16-1⅛	15⅛	25		21¼	27	6	1⅜	3½	15	20	1950	16
20	31½	17¾	1⅞	27½		20⅛	20¼	25	20-1¼	17¾	25		26⅜	33½	7	1½	3½	17½	23	3110	20
24	36½	21	1⅞	32		23¼	24⅛	29½	20-1⅜	21	25		29⅜	37¼	10	2¼	4	22½	28	4750	24
30	44½	26	2⅛	38½	28½		28¼	36	28-1⅝	25¾	28	26¾	35	44½	12	2½	5	29½	35	8410	30
36	53½	31¼	2⅜	46	31⅜		34¾	42¾	32-1⅝	31	28	30¼	42½	52⅞	15	2½	6	35½	42	13130	36
42	60	35¾	2⅜	53	37		39½	49½	36-1⅝	35½	38	33½	48¼	60¼	18	3	6	41½	48	18970	42
48	69	40⅝	2¾	59½	39		45	56	44-1¾	40⅝	28	36½	55¼	68¾	20	3	6	47½	54	23900	48

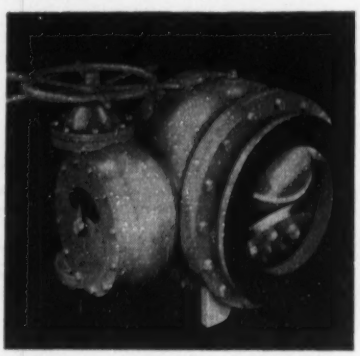
Smith opens new valve line

The new manual Smith ball valve is designed for 150 psi working pressure with 125 psi A.S.A. flanges (C.I.) and has three principal parts—the body, rotor and operating mechanism (picture at right).

The rotor is housed in the spherical body and has a circular port perpendicular to the axis of rotation. This port is aligned with the fluidway when the valve is in the open position. The rotor seats are located perpendicular to the fluidway. The operating mechanism employs a lever attached to an extension of one rotor trunnion; this lever moves the rotor 90 deg to open or close the valve.

According to the manufacturer, the valve closes easily under adverse conditions—a pipeline break, for instance—because flow velocity tends to close the valve. Metal to metal seats and a slight wedging action on closure are said to assure tightness.

The valve is available with standard flanged ends and also with bell or plain ends. Further, the valve can be furnished with end sections to match pipelines larger than the valve size. VALVE DIV., S. MORGAN SMITH CO., YORK 8, PA.



Correction—

A description of the Bosch electric impact tool (ENR July 15, p. 97) was partially incorrect in that it stated that the hole diameters bored by the rock drill ranged from $\frac{7}{16}$ to $\frac{1}{4}$ in. However, the drill sizes available will bore holes from $1\frac{3}{8}$ to 2 in. in dia.

King of the Turnpike!

MARION 151-M

● The MARION 151-M is the largest shovel working on the Ohio Turnpike. Its 7½ cubic yard dipper is slashing through king-size cuts on a 10-mile section near Akron.

A companion MARION 151-M equipped as an 8½ cubic yard dragline, works on the same section of the Ohio Turnpike, helping to move approximately 5 million yards of material including 1½ million yards of rock. These big MARION machines, ranking with the largest ever used in a highway project anywhere, keep a large fleet of big trucks busy.

They are adding to the proud reputation of the MARION 151-M for getting big jobs done fast.

MARION POWER SHOVEL CO.

MARION, OHIO, U. S. A.

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from ¾ to 45 cu. yds.

IN ALL PRINCIPAL CITIES

OSGOOD • GENERAL — A subsidiary manufactures excavating machines from ½ to 2½ cu. yds., truck cranes from 15 to 25 tons, mobilcranes from 25 to 45 tons, and log loaders.

EXCESSIVE END BIT WEAR CAN BE STOPPED

One example of the 150 types of end bits manufactured by ESCO, this Shasta type end bit is used on dozers for punching out work on difficult terrain.

ESCO End Bits are cast of special alloy steel for longer life on any job!

Why tolerate excessive end bit wear and downtime? Economy minded operators of dozers, scrapers and graders are finding *ESCO* End Bits lick excessive wear and last longer on either rocky or abrasive operations.

ESCO End Bits are *cast* of special alloy steel, designed for maximum shock and wear resistance under *any* dozing conditions. And because *ESCO* End Bits are *cast, not* rolled or forged, metal thickness and wear resistance are located where they are needed most. Blade weight and shape are correct for maximum bite, and wear. For example, note the shape and distribution of metal on the *ESCO* Shasta type end bit illustrated above.

ESCO makes 150 types of end bits to fit dozers, scrapers, or graders of all major manufacturers and they cost no more than ordinary end bits. Keep *your* production higher with *ESCO* End Bits. For details, see your nearest *ESCO* dealer, or write direct.

ESCO

Offices and Warehouses: Honolulu, Hawaii; Houston, Texas; New York, New York; Los Angeles, San Francisco, California; Seattle, Spokane, Washington; Centralia, Pennsylvania; Eugene, Oregon; Salt Lake City, Utah. In Canada: Vancouver, British Columbia, and Toronto, Ontario.

ELECTRIC STEEL FOUNDRY CO.

2142 N. W. 25th AVENUE, PORTLAND 10, OREGON — 712 PORTER ST., DANVILLE, ILL.

PUBLICATIONS

Heating and air conditioning – Two catalogs—one on commercial and industrial heating and ventilating units, the other on air conditioning units—are now available. The two 40-page catalogs are designed to help plan, specify and order the proper units to solve problems involving the moving, heating or cooling of air. Each catalog is divided into five separate data sections: descriptive, performance, layout, engineering and service. Heating and ventilating units are covered with air volumes ranging from 1200 cfm to 23,000 cfm; heating capacities from 100,000 Btuh to 2,500,000 Btuh. Air conditioning units range from 1,200 cfm to 21,000 cfm air volume; cooling capacities from 20,000 to 2,000,000 Btuh. Heating and Ventilating units — Catalog 1620. Air Conditioning units — Catalog 1630. Westinghouse Electric Corp., Sturtevant Div., Dept. T-126, 200 Readville St., Hyde Park, Boston 36, Mass.

Retaining walls – "Lock Up Unruly Slopes Behind These Metal Walls" is the title of a new illustrated folder describing how metal bin-type retaining walls confine earth and stabilize embankments along highways, railroads, streets and streams. Photographs of typical erection and installation scenes are shown. Armco Drainage & Metal Products, Inc., Middletown, Ohio

Water treatment – Water treatment for cooling towers is the subject of a new informational bulletin discussing the types of cooling systems together with such problems as corrosion of metal surfaces, inorganic scaling, organic growths and delignification of the wood in the tower. Information on the selection of chemical treatment is included in the bulletin along with a table showing the type and amount of treatment found to be effective for prevention of scale or corrosion under various operating conditions. Bulletin 28X7501A. Allis-Chalmers Mfg. Co., 1018 S. 70th St., Milwaukee, Wis.

Rock bolting – A very informative booklet on the subject of rock bolting procedures and techniques has been prepared. It is intended as a general guide for rock bolting techniques and describes briefly a complete line of equipment manufactured for this equipment. Form 4155. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Bituminous plant—A new 8-page folder describes the new Pioneer Model 81 continuous mix bituminous plant. Bulletin No. 653 emphasizes construction and operational features of the plant and also includes a 3-page cutaway and detailed account of the flow of the material through the plant. PIONEER ENGINEERING WORKS, INC., 1515 CENTRAL AVE., MINNEAPOLIS 13, MINN.

Level and pressure control—"Chronoflo Level and Pressure Telemeter", Bulletin 230-K10, describes the application of Chronoflo telemetering to level control in reservoirs and elevated and ground storage ;to pressure control in pump discharge lines, distribution systems, booster stations, industrial processes, steam and gas lines; and to automatic pump control. BUILDERS-PROVIDENCE INC., 345 HARRIS AVE., PROVIDENCE 1, R. I.

Tractor attachment—A new 16-page catalog entitled "Power Equipment for Your Profit Zone" illustrates many of the jobs in industry and commerce said to be handled efficiently and economically by the Ford tractor. Also featured is a complete line of Dearborn equipment, including loaders, angle dozers, blades, cranes, snow plows, disks, mowers, and moldboard plows, and there are such specialized Dearborn tools as the post hole digger, subsoiler, tractor-mounted saw, scoop and scarifier. TRACTOR AND IMPLEMENT DIV., FORD MOTOR CO., 2500 E. MAPLE RD., BIRMINGHAM, MICH.

Gas regulators—A new 36-page catalog describes and illustrates cylinder manifold and pipeline regulators. Each regulator has a chart showing types of gages used with it, inlet and outlet connections, maximum flow cfh and maximum working pressure psi. For easy reference, the catalog is cross indexed so that a particular regulator may be located by its uses and by its gas service. AIR REDUCTION SALES CO., 60 E. 42ND ST., NEW YORK 17, N. Y.

Trussed rafter construction — Scale drawings are now available for a practical fabricating bench, on which all four basic members of Teco trussed rafters may be cut and grooved. The drawings and a new booklet "How to Build Wood Frame Teco Trussed Rafters" are available without charge from the TIMBER ENGINEERING CO., DEPT. FB, 1319-18TH ST., N. Y., WASHINGTON 6, D. C.

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EDITORIALS

Engineer to head TVA

NOMINATION by President Eisenhower of Brig. Gen. Herbert D. Vogel to be chairman of the Tennessee Valley Authority will be widely approved among engineers, especially by civil engineers. Trained as a civil engineer specializing in hydraulics, (See also p. 63) General Vogel will bring to his new task, if his nomination is approved, the type of engineering training and practical experience that would appear to be ideal for the administrative head of the TVA.

But, as Gen. Vogel must have realized with many misgivings when he agreed to accept the nomination, his success or failure in the new job is not going to depend on his engineering training or experience but on his ability to solve the much more difficult problems raised by the current conflicting political and economic philosophies as applied to the TVA. This is a fact that engineers as a group frequently overlook when they propose that engineers be named to head public agencies that build or operate engineering works.

We are confident that Gen. Vogel will bring to the new task the type of direction that should carry the TVA administration through the rough waters immediately ahead without too much trouble. He has the advantage of having been in public life all his active career. In recent years he has gained wide experience in working with people holding diverse views, including members of Congress. As an Army Engineer his approach to the subject of public versus private power development could be expected to be liberal. In accepting the nomination he has declared himself as believing in the objectives of the act setting up the Tennessee Valley Authority. The best wishes of the engineering profession will go with him as he takes on an assignment that is particularly difficult at this time.

Coordinated building research

MUCH NEEDED SUPPORT for the Building Research Advisory Board of the National Academy of Science, known as BRAB, has just come from a powerful and influential source.

The Chamber of Commerce of the United States has entered the campaign to bring research in all the various sections of the building industry into a coordinated program. It has published a booklet expounding the advantages of such a program and urging the construction industry to join and support the activities of the Building Research Institute, an affiliate of BRAB which will accept membership from all groups interested in building research.

BRAB has for its objectives: (1) correlation and dissemination of information on new developments in all areas of building research and technology; (2) correlation of research efforts and activities in related and interdependent fields of building technology; (3) stimulation of research in areas where research is lagging or neglected; and (4) advising federal agencies on building problems. It recognizes that most building materials and equipment manufacturers carry out research, but notes that such studies generally are limited to specific products, and little is being done on systems or major components of buildings, or on buildings as a whole.

It is heartening that the national chamber appreciates the need for integrated research and the role that BRAB can play in this field. And since such research will expand the market for the construction industry's services and products, participation, both physically and financially, in the activities of BRI and BRAB—would seem to be acts of self interest.

World-wide need for roads

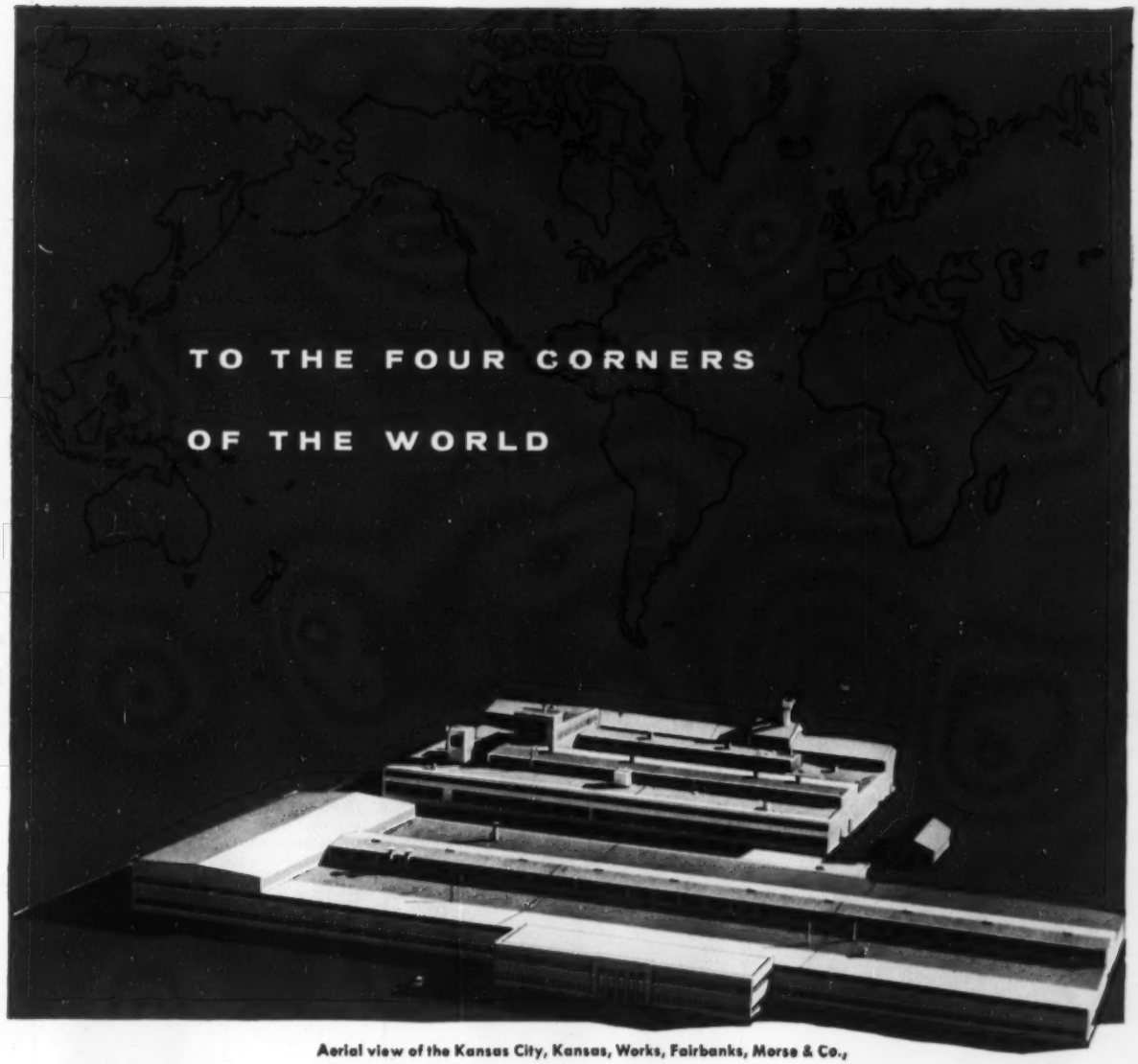
HIGHWAYS inadequate for traffic are by no means confined to the U. S. If our growth in numbers of motor vehicles vastly surpasses other countries of the world, their own increases have frequently approached ours in relation to the highway facilities available. And, in these countries—as here—inadequate road systems are exerting a brake on increases in national productivity.

Great Britain is probably worse off in this respect than any other country. Her traffic density in motor vehicles per mile is actually greater than ours, even though her vehicle registration is only about 10% of that in the U. S. Moreover, since the war, according to a study made by the London ECONOMIST, Britain's vehicle population has grown at a rate of about 7% a year. The U. S. average is about the same over the past eight years, but the yearly increases during that period have dropped from about 10% to 3%.

The ECONOMIST prophesies that Britain's vehicle population will increase 50% by 1965. Projecting a similar growth in the U. S. would give us 85 million vehicles at the end of the next decade. In neither country, however, can these numbers of vehicles be moved about on the roads that will be available in 1965, at the present rate of road building.

The alternatives for both countries are clear—step up road building or be prepared to witness a slowdown in the growth of highway transportation and therefore national productivity. As the ECONOMIST puts it, "Investment in new motorways may or may not yield 'higher returns' than investment in coal, steel or power; the point is that without it the country's other industrial investment as a whole cannot yield its full benefit, and some shift of the balance towards spending on the roads cannot be delayed."

That is as true in the United States as it is in Great Britain.



Aerial view of the Kansas City, Kansas, Works, Fairbanks, Morse & Co., 3601 Kansas Avenue.

...from Kansas City

Yes, from our new, modern-as-tomorrow works at Kansas City, we serve the world's needs for pumps.

As a major supplier of quality pumping equipment, it is particularly suitable that this new Fairbanks-Morse plant be located at an important crossroads of the world ... Kansas City. In this new plant 190,000 square feet of manufacturing space and a complete foundry occupying 150,000 square feet are devoted to bringing better service to our customers all over the world.

Modern manufacturing, development and testing equipment backed by engineering and production skills of highly trained personnel combine to produce products of unmatched quality ... in performance, durability, economy. Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

Lowers the boom on maintenance costs with TIMKEN® bearings to take shock loads

TO help keep its newest, largest dragline—Model 1855—doing a rugged job with minimum time-out for maintenance and repairs, the Harnischfeger Corp. relies on 15 Timken® tapered roller bearings at vital points. Some of these applications are the intermediate swing shaft, digging and hoist drum shaft, bevel pinion shaft and fairlead.

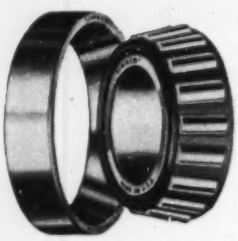
Imagine the shock loads put on the intermediate swing shaft when the cab, the boom and an 8 yard load of dirt being swung through the air are suddenly stopped and the direction reversed! Timken bearings take such shock loads with ease. That's because their rollers and races are case-carburized to give them tough, shock-resistant cores under hard wear-resistant surfaces.

The Timken bearings on the digging and hoist drum shaft take the full weight of lifting and lowering the loaded bucket. Full line contact between rollers and races of Timken bearings gives them the extra load carrying capacity they need. And due to their tapered design, they carry both radial and thrust loads in any combination. Timken bearings take the thrust loads from the pinion gears and fairlead, insure accurate alignment. Gears mesh smoothly, last longer.

To get steel good enough for Timken bearings, we had to make our own. We're the only U. S. bearing maker that does. So always specify Timken bearings. They give longer life with less friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

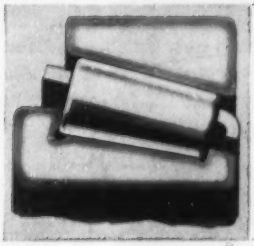
How **HARNISCHFEGER CORPORATION** mounts the fairlead of its Model 1855 dragline on Timken tapered roller bearings to insure minimum maintenance, longer life.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER — BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION